

JAMAICA.

ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

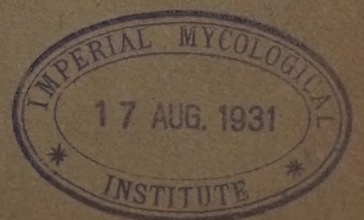
FOR

THE YEAR ENDED 31ST DECEMBER, 1930.

Ordered by His Excellency the Governor to be Printed.



JAMAICA
GOVERNMENT PRINTING OFFICE, KINGSTON.
1931.





PUBLIC GARDENS, KINGSTON. "SEYMOUR PLACE".



AQUARIUM PLANT HOUSE, HOPE GARDENS.



DEPARTMENT OF SCIENCE AND AGRICULTURE.

Report for the year ended 31st December, 1930.

I.—GENERAL OBSERVATIONS.

The planters of Jamaica have passed through a difficult period during the year 1930 due to the world-wide depression in trade and the difficulties of selling island produce, even at greatly reduced prices. The island rainfall for the year was 62.2 inches, or a shortage of over 14 inches on the average for the past 50 years. A serious drought extended from East Portland to Falmouth on the north coast which greatly affected the banana crop and caused great loss to pimento growers in that section of the island. Cattle suffered from the burning up of the pastures.

Despite these difficulties, however, record crops of bananas and of sugar were produced. The number of stems of bananas exported was $24\frac{1}{2}$ million in round numbers or an increase of over $2\frac{1}{2}$ million stems on the record crop of 1929. So great was the crop that at one period quantities of bananas ripened in the fields unharvested owing to lack of transport to foreign markets. The Co-operative Banana Association continued to flourish and it is now manifest that if this effort had not emerged as a successful business enterprise, the trade of the Colony would have had a very severe set-back during the year, for it has been the banana trade that has chiefly kept up the prosperity of the Colony despite the unfavourable markets for nearly all the other staples of the export trade.

Panama Disease increased by about 100 per cent. during the year, while the parish of Portland was permitted to treat the disease without departmental control, having reached the salvage stage over large areas of the frontage lands. The small cultivators of Portland are now extending bananas on the high hills and the Crown Lands are being planted up.

For the third year in succession we lost practically our whole crop of pollinated bananas at Castleton Gardens by a winter "Norther" and the number of new banana seedlings obtained during the year was only nine. Several hundreds of seeds were obtained from which further plants are expected.

The first-cross seedlings of the "Gros Michel" pollinated with "Robusta" have been found to be highly resistant to Panama Disease and also to yield seeds far more readily than the parent variety. No seedling has, however, yet attained to the length of finger required for commercial purposes. In order to extend the work of raising banana seedlings, four acres of land at Caymanas Estate, kindly let for the purpose by the owner, have been planted out with seedling bananas and other varieties required for the breeding work.

Two alleged "cures" for Panama Disease, were tested out by the inventors at the testing plot of the Government Laboratory. In each case the test plants developed the disease within two months. Several other "cures" have been propounded during the year and facilities have been provided for the testing of these methods by their sponsors on the special plot reserved for these trials.

Experiments were carried out on methods of destroying diseased banana stools without involving digging out the plants. Promising results were obtained by the use of a petroleum oil known as "gas oil", which killed the plants when poured over the stools at the rate of 1 to 2 quarts per plant. Field trials of the new method are now in hand.

Coconuts and Copra.—Despite the low prices over 30 million coconuts were exported. Copra increased from less than 8 million pounds to over 10 million. It is regrettable that the co-operative scheme for making coconut oil and securing the local trade for edible oils has not yet been effected. A local trade of £40,000 a year for edible oil is at present being lost which should be a useful asset to the coconut industry of the Colony.

Coffee.—The exports of coffee remained steady at rather less than 7 million pounds for the year. The market for Blue Mountain Coffee, after registering the highest price on record, suddenly collapsed and planters have found it difficult to sell their crop even at a substantial reduction on the average prices realised for this grade of coffee during recent years.

A certain amount of planting is still taking place despite the discouraging state of the market. Forty thousand and coffee plants were distributed from the Hope Nursery during the year.

Logwood continues to languish and exports of wood and "extract" were even lower than last year.

Ginger.—The exports of ginger show a gain of 160 tons over those for 1929. A scare in the United States was created through the spread of a mysterious disease with symptoms of paralysis which was attributed to the consumption of liquid extract of ginger, generally known as "Jamaica Ginger." It was eventually found that the ginger was not the cause of the damage but that the presence of certain ingredients used in connection with industrial alcohol was responsible for the illness of the consumers of the extract of ginger.

It is hoped that no lasting prejudice against the excellent and wholesome ginger of Jamaica will survive as a result of this scare.

Cocoa.—The cocoa trade remained steady with exports at about 3,000 tons for the year. The market for cacao has continued to be depressed and sales are difficult to effect.

Grapefruit.—The export of grapefruit shows a sharp decline from 120,000 boxes to rather less than 100,000 boxes. This was principally due to the raising of the standard whereby about 30,000 boxes of early fruit were prevented from being shipped. The new Co-operative Packing House was opened during the year and is equipped with the latest machinery for cleaning, grading, colouring and packing the fruit. This represents a big advance by the growers of citrus fruits in Jamaica who are now enabled to pack and ship their fruit with a refinement of technique equal to that of their bigger trade competitors in the United States.

Honey was a slightly larger crop than that of the previous year. The loss of the German market through a protective tariff was a serious set-back to the honey trade. If the honey industry can be rationalised by co-operative effort, its future is by no means unpromising.

The Bee Instructor of the Jamaica Agricultural Society has been in great request and has distributed a large number of Queen Bees of improved strains.

Pimento shows a slight gain over the crop of 1929 with a total of over 4,000 tons. A complete demoralisation of this trade was fortunately prevented by the formation of a Co-operative Pimento Association. Although trade has been slow and difficult, a fair price has been successfully maintained for pimento during the year.

Sugar exceeded all expectations by an export of over 47,000 tons, representing one of the largest crops since the installation of the vacuum process in place of the old muscovado system of sugar manufacture.

Owing to the bounty of £2 per ton paid by the Colonial Government for the crop of 1930 and the pooling of the market for local grocery sugars, the losses to the planters have been substantially reduced despite the complete demoralisation of the world markets for sugar.

Rum.—A series of crashes in the continental trade for rum made it very difficult for high-flavoured rums to be sold. There was a good local demand for the lighter "Common Clean" type of Jamaica Rum. A revolution has recently been effected on large areas of sugar lands in Jamaica by deep mechanical tillage, irrigation, the substitution of new canes for the old Jamaica cane, and the rational use of fertilisers mainly nitrogenous in character.

It is to these developments that the record crop of 1930 must rightfully be attributed.

Of the new canes the Barbados seedling BH (10) 12 has now generally displaced the White Transparent as the standard cane of Jamaica. Of the hybrid canes from Java, POJ 2725, POJ 2727 and POJ 2714 have made good on many cane lands in Jamaica in the order named.

During the past year the Department has issued plants of the "Wonder Cane" of Java named "POJ 2878," to every estate in the island and to many small settlers.

The highest recorded yield from cane on an estate in Jamaica was from the Java cane E K 28 in Vere where this cane gave 78 tons per acre which is about double the yield of the old estate cane. During the past decade the Hope Nursery has issued over 4 million plants of new canes to growers all over the island. The result of this work can now be seen in the complete revolution that has taken place in the varieties of sugar cane which now enable far higher yields of sugar to be obtained than formerly from the cane lands of the Colony. An application has been made at the instance of the Jamaica Imperial Association for a grant of £3,000 a year for 5 years from the Colonial Development Fund in order to finance an effective scheme of field research in the raising of new canes and the improved cultivation of sugar canes on the varied sugar lands of the Colony.

Distribution of Plants.—During the past three years the Department has made special efforts to extend the planting of grapefruit in the Colony. Over 126,000 plants of grapefruit have been recently distributed to growers all over the island. A free gift of plants to small settlers in Portland who had suffered loss from Panama Disease has resulted in 40,000 grapefruit plants being satisfactorily set out on diseased lands in Portland during the recent planting seasons under the guidance of the Inspectors of the Department.

Bombay Mangoes.—This luscious fruit is rapidly gaining recognition and large numbers of common trees are being converted into the Bombay variety by the process of budding. The Department has now converted 1,860 common mango trees on the Hope Estate, while 1,700 grafted plants of Bombay Mango were supplied to the public during the past year.

Coffee.—During the past three years the Department and the Jamaica Agricultural Society have co-operated in an effort to extend coffee among the small producers. Over 130,000 coffee plants grown from the best Blue Mountain seed have been issued from the Hope Nurseries to small growers all over the island.

Irrigation in Pedro.—An experiment in irrigating from wells in the dry zone of Pedro Plains in St. Elizabeth is now in progress. The Public Works Department has installed an engine and pump for one well and a large Aeromotor pump for another. The Department of Agriculture has laid out the land and established crops of Bombay Mangoes, grapefruit, bananas and catch crops to be cultivated under irrigation.

Animal Disease.—The Colony has to congratulate itself on a "nil" return for both Anthrax and Foot and Mouth Disease during the past year. The drought on the northside caused much trouble to stock-owners during the summer months but a rapid recovery has now been made and the general state of the livestock in the Colony may be regarded as satisfactory.

Public Gardens.—The new Aquarium Plant House at Hope has been a great addition to the attractions of Hope Gardens. We now have a tropical plant house 120 feet in length with a large octagonal aquarium structure which has already shown that it is an ideal plant house for a tropical garden in a dry and windy zone. The development of Adiantum ferns and foliage plants in this structure is most remarkable and satisfactory. The fishes in the Aquarium tanks are a great delight to visitors and a large increase in the number of persons visiting the garden has been occasioned by this novel attraction.

The Orchid collection continues to grow and prosper. A continuous display of flowers with a minimum of 80 blooms and a maximum of 250 flowers of the Cattleya family has been maintained throughout the year.

The Horticulturist secured some magnificent forms of modern hybrids of the Cattleya and Brassocattleya families from Messrs. Sanders of St. Albans, England, which were personally selected in that establishment by Mr. Downes when on leave.

A gothic arch to display the new rose-pink Bougainvillea, "Lady Stubbs" has been erected at Hope Gardens. The new public garden in Kingston which has been fashioned out of the old Parade Garden has added a touch of orderly decoration and green refreshment to the eye in the heart of the City.

The Hill Gardens at Cinchona have been thoroughly overhauled and the old pathways cleared so that it is now possible to walk to Newhaven Gap and other outlying parts of the property in comfort.

Government Stock Farm.—As a result of a successful year's work the Farm has been able from its own revenue to improve its equipment at a cost of £1,600 during the past year. Electro-magnetic milking for the native herd of 60 dairy cows, a Ruston and Hornsby Oil Engine of 37 H.P. from England for cutting up fodder and making ensilage have been provided. A Tractor has enabled silage crops to be planted during a severe time of drought. A fine Friesian bull has been imported from Canada, while the generosity of Lord Lonsdale has enabled the Stud Farm at Grove Place to place the services of the thoroughbred horse, "Royal Highness" at the disposal of the public. The services of this stallion have been fully engaged.

Farm School.—As a result of a Committee appointed at the instance of the Honourable Member for St. Ann, the staff and equipment of the Farm School have been improved. The branch at "Grove Place" will soon be opened. Two Scholarships were recently offered and fifty candidates competed. The Farm School continues to keep up its numbers at full capacity.

Reafforestation.—As a result of recent propaganda in reafforestation and the appointment of a special officer on the staff of the Surveyor General, greater efforts have been made in reafforesting lands and the planting of timber trees. The Agricultural Department has issued free of charge 83,000 plants of valuable timber during the past two years indicating a revival of public interest in this important aspect of our agricultural affairs.

II.—PUBLIC GARDENS.

Report of the Superintendent and Horticulturist.

I. HOPE GARDENS.

Orchids.—The orchid collection provided a continuous show of blooms in the Orchid House during the year. The varieties of exceptional merit which flowered were:—C. Hardyana regalis with 23 blooms; C. Hardyana alba var. Lady Veitch; C. Hardyana var. Albanensis; C. Empress Frederick; C. Soulangue; C. Gaskelliana alba, a rare variety imported in a batch of orchid plants from the forests of Venezuela; C. armainvillierensis gigantea; C. Enid alba var. The Queen; Lc. Isabel Sander; Lc. Gabrielle Petit; Bc. Albion F. C. C.; Bc. Cliftonii magnifica F. C. C.; Bc. Digbyano Mossiae, Westonbirt variety; Bc. Heatonensis x C. Dowiana, an unnamed hybrid of first class merit; Bc. Ursula, with flowers 9" across; and Slc. Firefly with 13 richly coloured blooms. The Cattleya labiata plants which were imported from Brazil during 1929 provided hundreds of blooms from June to September and among them were some very interesting varieties.

The standard of the collection was improved by the selection of a number of Cattleyas, Laeliocattleyas, Brassocattleyas, Brassolaeliocattleyas and Sophrolaeliocattleyas by the Horticulturist while he was on leave in England. The collection has been further increased by successful propagation by the division of the back pseudobulbs.

In addition to the species Vanda, Dendrobium, Aerides, Oncidium, Stanhopea, Phalaenopsis, Cypripedium, etc. the following list shows approximately the number of the Cattleyas, Laelias and their hybrids now forming the collection at Hope:—

Cattleyas	...	..	..	..	785
Laeliocattleyas	..	..	..	..	158
Brassocattleyas	..	..	..	..	87
Brassolaeliocattleyas	..	..	..	..	18
Sophrolaeliocattleyas	..	..	..	..	13
Laelias	..	..	..	..	13
Potinara	..	..	..	..	1
					1,075

The following crosses were successfully made and germinated, 4 Cattleya hybrids, 2 Laeliocattleya hybrids, 7 Brassocattleya hybrids, 1 Brassolaeliocattleya hybrid and 1 Sophrolaeliocattleya hybrid as follows:—

- C. Dowiana x C. Aumania
- C. Dowiana x C. Gaskelliana
- C. Dowiana x C. Hardyana regalis
- C. Aeneas x C. gigas
- Lc. Lustrissima x C. Maggie Raphael alba
- Lc. Dominiana x C. Hentschelli
- C. Dowiana x Bc. Thorntonii
- C. Dowiana x Bc. heatonensis
- C. Miss Measures x Bc. Pallas
- C. Dowiana x Bc. Olympus
- C. Dowiana x Bc. Mrs. J. Leeman
- C. Dowiana x Bc. speciosa
- C. Dowiana x Bc. Pallas
- C. Lueddemanniana x Bc. Ursula
- Sle. Magnet x C. Miss Measures.

In addition to the above 17 crosses have been made during the year but these are still in an unripened stage.

The general condition of the orchids continues to improve under our system of culture and the value of the collection has considerably increased.

Water Garden.—The ornamental vines which had grown densely over the divi-divi trees by the Water Garden were all cut away to allow a greater degree of light to reach the plants grown beneath. The desired results have been obtained in the improved appearance of the trees, and with the extra light reaching the Water Garden it is now possible to grow a large variety of flowering plants which will help to tone up the appearance of the growth around the pools.

Rose Garden.—The new site laid out for the Rose Garden as mentioned in last year's Report has proved very satisfactory. The system of irrigating the beds from a concrete gutter running parallel to the beds has proved successful and the vigour of the plants could be judged by the quantity of blooms to be seen during every month of the year.

Shrubberies.—A clearance was made of the old shrubs growing near by the Plant House and the site laid out in a more uniform planting of the Bougainvillea 'Ruby.' A concrete bridge with rustic side rails was built in place of the culvert across the water channel running through the Gardens. Along the channel Daturas, Hedychiums, Caladiums and other shade-loving plants have been planted.

Plant House.—The Public Works Department constructed on octagonal-shaped house 40 feet in diameter with six aquarium tanks around the sides. In the centre a circular tank encloses a rockery with a bird fountain in the centre. A congenial atmosphere is obtained for growing many varieties of exotic plants. A corridor 20 feet long connects up this Plant House with the Orchid House.

Archway.—An iron archway was erected at the eastern end of the Orchid Walk. This arch is 24 feet high and at the base are planted two plants of our new hybrid Bougainvillea 'Lady Stubbs.'

Distribution of Plants.—During the year 37,200 grapefruit seedlings were distributed free to small settlers in the parish of Portland for planting on lands devastated by Panama Disease. There were also distributed during the year 1,633 budded citrus and 1,729 grafted Bombay Mango plants. In spite of the severe drought a total of 37,898 timber seedlings were distributed free.

General.—The nursery has had to be further extended along the central avenue to the Gardens to provide more space for the raising of citrus and coffee seedlings. The severe drought which was experienced during the year was responsible for the loss of several thousands of citrus, coffee and timber seedlings. Several rockeries were formed in the vicinity of the Plant Houses and planted with Begonias, Geraniums, Ferns, Caladiums, etc.

PLANTS DISTRIBUTED FROM HOPE GARDENS, 1930.

					<i>Sold.</i>
Economic Plants—					
Coffee	...	..	...	...	38,660
Cacao	...	...	...	...	247
Citrus—Seedlings	..	...	...	...	28,041
Citrus Budded Plants	...	...	...	...	1,633
Mango—Grafted Plants	..	...	...	...	1,729
Miscellaneous	..	...	...	...	2,817
					73,127
Ornamental Plants					28,199
					101,326

Free Grants

Economic Plants—				
Coffee	..	..	..	1,000
Cacao	..	..	..	..
Citrus—Seedlings	..	..	..	37,453
Cane Tops and Cuttings	..	..	..	143,002
Elephant Grass Cuttings	..	..	..	17,600
Timber Trees	..	..	..	37,898
Miscellaneous	..	..	..	296
				237,249
Ornamental Plants	..	..	..	3,089
				240,338
Total number of Economic Plants				310,376
Total number of Ornamental Plants				31,288
Total number of Plants distributed				341,664

The following statement shows the distribution of plants for the last three years from the Nursery at Hope:—

					1930.	1929.	1928
Coffee	..	..	..	..	39,660	50,581	41,973
Cacao	..	..	..	..	247	313	1,985
Citrus—Seedlings	..	..	..	..	65,494	13,225	44,096
Citrus—Budded Plants	..	..	..	..	1,633	968	1,276
Mango—Grafted Plants	..	..	..	..	1,729	676	721
Cane Tops and Cuttings	..	..	..	..	143,002	144,087	206,633
Elephant Grass Cuttings	..	..	..	..	17,600	20,640	13,304
Timber Trees	..	..	..	..	37,898	45,198	2,229
Miscellaneous Fruit and Economic Plants	..	..	..	..	3,113	4,510	2,893
Ornamental Plants	..	..	..	..	31,288	30,847	30,160
					341,664	311,045	345,270

2. CASTLETON GARDENS.

During the year these Gardens were visited by numerous picnic parties and by tourists. The accommodation provided by the Jamaica Tourist Association in the way of a tea house, dressing houses for bathing parties and public conveniences have added considerably to the comfort of visitors to these Gardens.

After the heavy rains in October several of the paths had to be re-gravelled.

The usual routine of billing lawns, pruning shrubs, forking and weeding beds and propagating plants for the Hope Gardens Nursery was regularly attended to and the Gardens kept in good order.

PLANTS DISTRIBUTED FROM CASTLETON GARDENS, 1930.

Sold.

Economic Plants	..	..	..	289
Ornamental Plants	..	..	..	1,148
				1,437

Transferred to Hope.

Economic Plants	..	..	..	470
Ornamental Plants	..	..	..	18,254
				18,724
Total number of Economic Plants				759
Total number of Ornamental Plants				19,402
Total number of Plants distributed				20,161

3. PUBLIC GARDENS, KINGSTON.

The unsightly shrubbery to the west of the Parade Gardens was cleared and laid out in lawn. Several new Canna beds were opened up on the lawns for planting new varieties of Canna. Two trees of *Casuarina* (*C. equisetifolia*) were cut down as they were in a dying condition. The work of erecting boundary rails to protect the lawns was continued during the year. The general routine of maintaining the Kingston Gardens, the lawns around the Public Buildings, the Memorial Square, the old Treasury site and Head-quarter House Gardens, was regularly attended to.

4. HILL GARDENS, CINCHONA.

An extra grant of £25 was voted to continue the clearing of the plantation paths and for the maintenance of those which were opened up the previous year.

The collection of *Gladiolus* bulbs flowered very freely and gave the Gardens a bright appearance during their flowering season which extended over a period of several months due to successive plantings.

There was a large demand for Christmas Trees which were supplied from the surrounding woodlands.

General repairs to the Houses were carried out by the Public Works Department.

The usual routine work was regularly attended to and the Gardens kept in a tidy condition.

5. KING'S HOUSE GARDENS.

The work of converting the shrubbery along the drive into lawn and the planting of an avenue of *Poinciana regia* along the main drive was completed.

The Plant House was removed as it was found to be of no practical use in the Garden. It was discovered after dismantling the house that the woodwork was so rotten that it was of no further use.

The trees in close proximity to the house were cleared of *Tillandsia* and a definite improvement in the life of the trees has been observed since this parasite has been removed.

An incinerator was erected by the Public Works Department for burning garden refuse.

The pastures under the care of Mrs. L. A. Crooks and Mr. Harold Bolton were maintained in a clean condition. The other pasture lands surrounding the Gardens were regularly cleaned by the Department.

The general routine work of mowing lawns, weeding and pruning shrubberies and house decorations was regularly attended to by the Garden staff.

6. GORDON TOWN GARDEN.

The small enclosed garden at Gordon Town was maintained in a tidy condition out of the Hope Gardens Maintenance Vote.

7. BATH GARDEN AND NURSERY (ST. THOMAS).

Mr. R. Glen Campbell, Inspector of Plant Diseases, who is in charge of the Bath Garden and Nursery reports as follows:—

During the year a Talipot Palm flowered in this Garden. This tree was a seedling from a Talipot Palm which flowered in the same Garden in 1902. Other Talipot Palms flowered at Stoke's Hall and Fontabelle Estates and at the residences of Mr. E. D. Kinkead and Mr. L. L. Carrington in St. Andrew. These were also seedlings of the palm that flowered in 1902.

A coffee nursery is being established in place of the citrus nursery which was not successful.

Ornamental plants were added to the collection already in the Garden.

The usual routine work was carried out and the Garden kept in a tidy condition.

8. SUMMARY OF PLANTS DISTRIBUTED BY THE DEPARTMENT DURING THE LAST THREE YEARS.

	1930.	1929.	1928.
Coffee	39,660	50,931	41,973
Cacao	247	313	1,985
Citrus—Seedlings ..	65,494	13,225	44,096
Citrus—Budded Plants ..	1,633	968	1,276
Mango—Grafted Plants ..	1,729	676	721
Cane Tops and Cuttings	143,002	144,087	206,633
Elephant Grass Cuttings	17,600	20,640	13,304
Timber Trees ..	37,898	45,198	2,229
Miscellaneous Fruit and Economic Plants	3,872	4,954	2,991
Ornamental Plants ..	50,690	31,841	31,072
	<u>361,825</u>	<u>312,833</u>	<u>346,280</u>

9. The Garden and Plantation Sales for the last three years have been as follows:—

	£	s.	d.
1930	761	19	9
1929	692	17	7
1928	780	10	0

10. The Rainfall at the various Gardens for the year under review is as follows:—

1930.		Hope Gardens.	Castleton Gardens.	Public Gardens, Kingston.	Hill Gardens, Cinchona.	King's House Gardens.
January	..	2.88	4.14	1.72	4.94	1.90
February	..	3.12	5.47	0.94	7.18	3.55
March	..	0.89	0.95	0.53	1.30	1.00
April	..	4.34	15.29	1.69	14.96	5.01
May	..	5.61	14.64	0.39	6.34	2.95
June	..	2.20	4.43	0.91	3.81	1.19
July	..	0.53	4.13	0.39	1.62	1.10
August	..	2.41	3.20	1.78	0.87	1.38
September	..	2.20	4.04	0.97	2.11	2.57
October	..	4.20	6.15	3.09	7.57	3.24
November	..	9.40	21.54	4.03	32.94	6.99
December	..	1.44	4.16	0.14	2.55	0.69
		<u>39.22</u>	<u>88.14</u>	<u>16.58</u>	<u>86.19</u>	<u>31.57</u>

11. Contributions to the Gardens have been received from the following:—

Foreign.

M. J. Rivero, Cali, Colombia.
 Agri-Horticultural Society of India.
 C. W. v. Hirschberg, British Vice-Consulate, Elisabethville, Belgian Congo.
 Canal Zone Experiment Gardens, Summit, Canal Zone.
 F. Benbow-Rowe, Shanghai.
 J. Cunningham, 65 Fenchurch Street, London, E.C. 3.
 United Sugar Companies, Mexico, S. A.
 Department of Agriculture, Trinidad.
 Department of Agriculture, Barbados.
 Conservator of Forests, Belize, British Honduras.

Local.

Jamaica Agricultural Society, Kingston.
 Mrs. Sheriff, Linlithgow, Halfway Tree.
 Medical Superintendent, Lunatic Asylum.
 Edward Foster, Montego Bay.
 Alex. Davidson, 40 Duke Street, Kingston.
 L. L. Carrington, Jamaica Agricultural Society, Kingston.

M. S. GOODMAN,
 Superintendent of Public Gardens.

E. DOWNES,
 Horticulturist.

III.—AGRICULTURAL EXPERIMENTS.

Report of the Acting Superintendent of Agriculture.

The year under review has been a very bad one for the sugar-cane planters. Very low prices, much below the cost of production, prevailed throughout the year and added to this the rainfall for the year was far below the average.

Although two successive years of drought have been experienced the crop this year has been a very good one and the yield in tons cane per acre was as good as the previous year. This is due, as was mentioned in last year's Report, to the better methods of cultivation now in practice and the extension of the better varieties of seedling canes. Very high yields have been obtained this year from B.H. 10 (12), Ba. 11569 and E.K. 28; yields of from 60 to 78 tons per acre being frequently obtained.

Owing to the very low price of sugar the cane planters have been putting in bananas where possible but there are certain cane districts in which it is impossible to grow bananas. For instance, in Westmoreland, at Shrewsbury Estate, an eight-acre field was planted in bananas. The field was thoroughly cultivated and drained and the owner spent a large sum of money to provide water for the irrigation of this field but with all the care that could possibly be given the bananas have been a total failure. The plants at no time showed a healthy appearance and the bunches were small and inferior. Should the cane planters in Westmoreland have to cease growing sugar-cane on account of low prices it is clear that they would have to turn their attention to some other crop than bananas or abandon their estates.

Mosaic.—Mosaic Disease is steadily decreasing as the planters are now paying much more attention to roguing and the selection of healthy tops for planting; also they are increasing their areas in resistant varieties. The P. O. J. varieties are gradually superseding the Uba where this cane had been extensively planted to help to control Mosaic Disease. In some districts where Mosaic Disease was very prevalent it is now possible to again grow some of the more susceptible varieties where it was impossible to grow them before as they were badly attacked by the disease.

Canes.—The standard varieties Ba. 11569 and B.H. 10 (12) continue to give good results and very large yields have been obtained from them this year. The general opinion of planters through the Island is that the B.H. 10 (12) is the better cane both as plants and ratoons.

The S.C. 12/4 has given fairly good results but it appears as if it is not going to ratoon very well in the heavy clay soils. The E.K. 28 is a very promising variety for the Vere district and it has given as much as 78 tons per acre but in some other districts it has not done so well.

The P.O.J. 2725 and P.O.J. 2714 are showing good promise but the P.O.J. 2727 has so far proved to be a cane with very poor juice. The P.O.J. 2714 as plants and ratoons is very promising and is preferred by some planters to either the P.O.J. 2725 or P.O.J. 2727.

It is very pleasing to report the interest the cane planters are taking in introducing and experimenting with the newer varieties of sugar cane which are immune to Mosaic Disease with the hope that these may help them to reduce the cost of production as some planters spend a large sum of money every year in roguing the disease and also in replacing the Uba which costs more to reap than the other varieties.

Varietal Experiments.—Plots were laid out at March Pen Estate, St. Catherine, but several of them were damaged and could not be reaped. The plots were only 13 months old when reaped and the following Table shows the results obtained.

Estate—March Pen, St. Catherine.

Field Section 20.

Cane.	Ton- nage	Sp. Gr. 30°-16.6 C.	Degrees Brix.	Sucrose %	Glucose %	Total Solids %	Glocose Ratio	Purity.
Ba. 11569	44.37	1.0804	20.3	18.09	0.57	21.93	3.15	82.48
B.H. 10 (12)	35.75	1.0751	19.1	17.07	0.935	20.53	5.47	83.14
B. 417	31.75	1.0791	20.0	17.82	0.55	21.58	3.08	82.57
H. 109	22.62	1.0716	18.3	14.36	1.54	19.61	10.72	73.22

Manurial Experiments.—Manurial experiments were laid out on several estates but owing to various reasons only three plots were reaped, viz., at Belmont, Llandoverly and Morelands Estates. At Belmont Estate where the rainfall for the year was far below normal and where there is no irrigation the results are not satisfactory and cannot be taken as conclusive as in some cases the control plots gave slightly better results than the manurial plots. At Llandoverly Estate where the rainfall was better than on the above estate the results are more conclusive and the plots which gave the best results are those that received a 'complete manure' and 'Nitrogen and Double Potash' and 'Nitrate of Soda.' At Moreland Estate the rainfall was low but the plots were irrigated. Before planting the field was knifed to a depth of two feet and then mould bored but the results are most unsatisfactory apparently due to irregular irrigation.

The following are the results:—

Estate—Belmont.

Field—Top Montague—Ratoons.

Plot Description.	Sulp. Ammonia.	Nitrate of Soda.	Ammo.-Phos.	Super- phosphate	Sulp. Potash.	Per Acre.			
						Cost.	Tons Cane	Increase	Profit or Loss.
1. Control	cwt.	cwt.	cwt.	cwt.	cwt.	..	26.50	..	..
2. Nitrogen	2	..	..	..	..	30/-	30.00	6.05	+30/6
3. Nitrogen & Phos.	..	..	2	..	..	33/2	21.87	- 2.18	-55/-
4. Control	..	..	..	..	..	..	21.61	..	..
5. Nitrogen	..	2	..	..	..	34/6	24.75	3.70	+ 3/-
6. Nitrogen & Potash	2	..	..	..	1	44/9	23.87	2.82	-16/7
7. Control	..	..	..	..	..	..	20.50	..	..
8. Nitrogen & Potash	..	2	..	..	1	49/3	24.00	2.32	-26/1
9. Potash	..	..	..	..	2	29/6	19.12	- 2.56	-55/1
10. Control	..	..	..	..	..	..	22.87	..	..
11. Complete	2	..	..	3	1	64/3	24.25	1.38	-50/5

*Estate—Llandovery.**Field—Plantain Walk—Plant Canes.*

Plot	Description.	Sulp. Ammonia.	Ammo-Phos.	Nitrate of Soda.	Nitrolin.	Super- phosphate.	Sulp. Potash.	Per Acre.			
								Cost.	Tons Cane.	Increase.	Profit or Loss.
		cwt.	cwt.	cwt.	cwt.	cwt.	cwt.				
1.	Nitrogen ..	2½	..	..	..	..	..	37/6	62.00	2.50	- 12/6]
2.	Control ..	..	..	..	..	..	..	..	59.50	..	..
3.	Nitrogen ..	..	2½	..	..	..	..	41/5	60.00	0.50	- 36/5
4.	Nitrogen ..	..	..	2	..	..	..	43/1	67.50	17.50	+ 131/11
5.	Control ..	..	..	..	..	..	..	..	50.00	..	..
6.	Nitrogen ..	..	..	..	2	..	..	20/-	57.00	7.00	+ 50/-
7.	Potash ..	..	..	..	..	..	2	29/6	58.50	2.00	- 9/6
8.	Control ..	..	..	..	..	..	..	..	56.50	..	..
9.	Phosphates ..	..	..	..	..	3	..	19/6	59.00	2.50	+ 5/6
10.	Nitrogen & Potash ..	2	..	..	..	..	1	44/9	68.00	7.50	+ 30/3
11.	Control ..	..	..	..	..	..	..	..	60.50	..	..
12.	Nitrogen & Potash ..	..	..	2	..	..	1	49/3	68.00	7.50	+ 25/9
13.	Complete ..	2	..	..	..	3	1	64/3	71.00	15.00	+ 85/9
14.	Control ..	..	..	..	..	..	..	..	56.00	..	..
15.	Nitrogen & Double Potash ..	2	..	..	..	..	2	59/6	76.50	20.50	+ 145/6

*Estate—Morelands.**Field—Peauta Pong—Plant Canes.*

Plot	Description.	Sulp. Ammonia.	Nitrate of Soda.	Ammo-Phos.	Super- phosphate.	Sulp. Potash.	Lime.	Per Acre.			
								Cost.	Tons Cane.	Increase	Profit or Loss.
		cwt.	cwt.	cwt.	cwt.	cwt.	ton.				
1.	Control ..	..	..	..	..	..	..	..	39.88	..	..
2.	Nitrogen ..	2½	..	..	..	..	..	37/6	46.25	3.25	- 5/-
3.	Nitrogen & Phosphate ..	..	..	2½	..	..	..	41/6	38.38	- 4.62	- 87/9
4.	Control ..	..	..	..	..	..	..	..	46.12	..	..
5.	Nitrogen ..	..	2	..	..	..	..	34/6	47.88	2.20	- 12/6
6.	Nitrogen ..	2	..	..	..	..	..	30/-	46.00	0.32	- 26/11
7.	Control ..	..	..	..	..	..	..	..	45.25	..	..
8.	Potash ..	..	..	..	..	1	..	14/9	42.85	- 2.08	- 35/4
9.	Phosphates ..	..	..	..	3	..	..	19/6	45.25	0.32	- 16/4
10.	Control ..	..	..	..	..	..	..	..	44.62	..	..
11.	Nitrogen & Potash ..	2	..	..	..	1	..	44/9	44.62	- 0.81	- 52/10
12.	Nitrogen & Phosphate ..	2	..	..	3	..	..	49/6	48.00	2.57	- 23/10
13.	Control ..	..	..	..	..	..	..	..	46.25	..	..
14.	Complete ..	2	..	..	3	1	..	64/3	38.12	- 3.63	- 100/7
15.	Lime ..	..	..	..	..	..	1	20/-	46.12	4.37	+ 23/9
16.	Control ..	..	..	..	..	..	..	..	37.25	..	..
17.	Nitrogen & Potash ..	..	2	..	..	1	..	49/3	38.50	- 1.43	- 73/7
18.	Nitrogen & Phosphate ..	..	2	..	3	..	..	54/-	45.12	5.19	- 2/1
19.	Control ..	..	..	..	..	..	..	..	42.62	..	..

M. S. GOODMAN,
Acting Superintendent of Agriculture.

EXPERIMENT STATION, HOPE.

Report of the Plant Breeder.

Canes.—The year under review has been a very dry one the rainfall being much below the average and during the dry months of the year there was no water available for irrigation. The total rainfall for the year was 39.22 inches as against an average of 51.73 inches for the past 50 years.

During the year 143,002 tops and cuttings of various varieties of sugar-cane were distributed thus making a total of 3,724,934 tops and cuttings distributed free to cane farmers for the past eleven years. From the table below it will be seen that a large number of cuttings were distributed of the resistant varieties, viz., P.O.J. 2725 and P.O.J. 2727. There was again this year a good demand for Uba, chiefly from the small settlers.

Three cuttings of P.O.J. 2878 were received in July, 1928, one of which died. The other two cuttings were grown under quarantine for one year and having remained free from disease for that period they were cut up and replanted. From these there have already been distributed 4,628 cuttings, or enough to plant approximately 3 acres, not including the cuttings we have used for planting out a large area for supplying cuttings from Hope in following years.

The following is a list of the varieties and quantities of each distributed:—

P.O.J. 2725	..	..	..	..	49,001
P.O.J. 2727	..	..	..	..	35,123
Uba	..	..	..	..	27,874
Ba. 11569]	..	..	..	..	9,215
P.O.J. 2714	..	..	..	..	4,892
P.O.J. 2878	..	..	..	..	4,628
C.H. 64/21	..	..	..	..	2,650
S.C. 12/4	..	..	..	..	2,565
B. 417	..	..	..	..	2,080
White Transparent	..	..	..	..	1,162
B.H. 10 (12)	..	..	..	..	1,150
H. 109	..	..	..	..	600
P.O.J. 2379	..	..	..	..	600
Mexican Striped	..	..	..	..	549
E.K. 28	..	..	..	..	500
Badila	..	..	..	..	400
B. 1529	..	..	..	..	13
Total					143,002

With regard to the variety P.O.J. 2725 to which we drew attention last year with regard to its free flowering it is now our opinion that this variety should be cut as soon as possible after its flowers are ripe and begin to blow as after this stage the cane develops a pithy centre and loses weight rapidly. This cane is rapidly replacing the Uba in the districts where Mosaic Disease is prevalent.

The P.O.J. 2727 has given very good tonnage this year but owing to this cane developing a pithy centre at an early period of growth it is not advisable to plant large areas of it. The juice is also poor in sucrose.

P.O.J. 2714 is very promising both as plants and ratoons and does not develop the pithy centre like the two above varieties and the juice is better. This variety is being extended in the rainy districts.

B.H. 10 (12) continues to give good results both as plants and ratoons and is being rapidly extended. This cane as ratoons has on many estates yielded over 50 tons per acre.

S.C. 12/4 has so far given fair results but it is clear that it does not like a very heavy clay soil. It is our experience that this variety is a very early maturing cane and would be very suitable for estates which have to start reaping in December. This variety gave a Beaumé of 11° in early December while other varieties gave a Beaumé of from 6° to 8°.

P.O.J. 2878. This variety has given wonderful results in Java and it is hoped that it will suit the conditions here and increase the tonnage per acre which will help to reduce the cost of production. Cuttings of this variety will be available during 1931.

The varieties F.M. 131, S.M. 133 and S.M. 134 developed Mosaic Disease to an enormous extent and had to be discarded as being unsuitable.

The Co. 281 and Co. 213 are not promising under our conditions but a further trial is being given them.

The following varieties were received during the year from the Department of Agriculture, Barbados, and are being grown under quarantine at the Government Laboratory:—B. 891 and B. 726.

During the year a field which had been growing Uba cane since 1920 was cultivated with a disc plough drawn by a Fordson Tractor and it was remarkable to see the discs slicing the huge Uba stools into small bits. It would have been impossible to plough this field with a moldboard plough without first digging out the Uba stools. This field was again planted with Uba.

Bananas.—The section planted out in October last year came into fruiting at nine months and produced good bunches. Trapping for Banana Borer was continued throughout the year and this pest is now under control. The Cultivator drawn by steers was run between the rows of bananas monthly and this gave good results.

Citrus.—The Citrus Grove was extended during the year and the area planted chiefly with Marsh Seedless Grapefruit is doing nicely. The grove has been sprayed at intervals with Lime Sulphur Wash against the attacks of the Citrus Black Fly which is very prevalent in this district.

Coffee.—The plots planted out in 1929 for growing Long Top Coffee are doing well. The Short Top section was extended during the year. Quite a good crop of seed coffee was reaped from the old trees during the year.

Cacao.—The usual pruning was carried out by the students and the crop harvested and cured by them.

Cassava.—A varietal test is being carried out on the following varieties of Bitter and Sweet Cassava:—

Bitter—Blue Bud, Cotton Tree, Bunch of Keys, White Stick, Spanish Town, Hanover, Malta Hotel.

Sweet—George Blade, New Stick, Yellow Belly, Spanish Town, Blue Bud.

School Garden.—The students continued to grow vegetables comprising tomatoes, cabbages, turnips, carrots, beet and Irish potatoes. The varietal test with tomatoes carried out during the year proved that Gulf State and Marglobe are better for our conditions than Earliana and June Pink. Ponderosa is very acceptable in the local market but is considered too large and coarse for the export trade.

Agricultural Education.—The Farm School students continued to visit the Experiment Station for five days each week and received instruction in nursery work as well as the proper method of cultivation of all the crops in the Experiment Station. They have done practical work in budding, and grafting and in ploughing, forking, pruning, mulching and the preparation of fungicides and insecticides.

Mr. L. A. Powell, the Master in charge of the students in Practical Agriculture, has taken a keen interest in this part of his work.

M. S. GOODMAN,
Plant Breeder.

IRRIGATION EXPERIMENTS IN THE PEDRO PLAINS.

An experiment in irrigating from wells in the very dry area of the Pedro Plains in St. Elizabeth was started during the year on lands of Mr. Brodie, Williamsfield. The approximate area is nine acres and is divided into two plots as follows:—Plot I—irrigated by an engine and pump for one well; Plot II—irrigated by a large Aermotor for the other well; the machinery being installed by the Public Works Department.

The Department of Agriculture was responsible for cleaning up and laying out the land for the establishment of various crops under the supervision of Mr. E. M. Falloon. Before any planting could be done fences had to be erected for protection against straying animals.

Plot I.—approximately 6½ acres—was ploughed and cross-ploughed and irrigation trenches made to convey the water to various parts of the field which slopes in an easterly direction. Grafted Bombay Mango plants were set out at 48 feet apart each way. Budded and seedling grapefruit plants were set out 24 feet apart each way between the mangoes. Banana suckers were set out 12 feet apart each way, between the above. Catch crops of tomato varieties, cabbage, Irish potatoes, cauliflower (Indian) lettuce, onion, sweet potatoes and various kinds of beans were planted between the mangoes, grapefruit and bananas. On the slope where irrigation is difficult a small plot of pine-apples has been planted, also a few Avocado pear plants. Plot II.—The water for the irrigation of this plot which is approximately 2½ acres is pumped by a large Aermotor from a well in the plot and stored in a tank. During light winds it is impossible to obtain a sufficient water supply. This plot was cultivated in the same manner as Plot I and bananas, tomatoes, cabbage, lettuce, cauliflower, cassava varieties, Irish potatoes and a small plot of tobacco planted out.

Some of the catch crops such as cabbage, cauliflower, tomatoes and Irish potatoes have been reaped and the results are very promising. The mangoes, grapefruit and bananas are growing satisfactorily.

A Montgomery Red Poll Bull was purchased by the Government and sent to the Pedro Plains in the care of Mr. Bennett, Mountainside, for the use of the small settlers of this district. A small fee is charged for the use of the bull which is credited to General Revenue.

M. S. GOODMAN,
Actg. Superintendent of Agriculture.

IV.—DISEASES OF ANIMALS.

Report of Government Veterinary Surgeon.

1. GOVERNMENT FARM SCHOOL, HOPE.

During the year I gave lectures and demonstrations in Veterinary Science to the three classes of students at the Farm School on a schedule of three lecture periods of two hours each three times a week.

The lectures to the First Year Class dealt with: (i) The position and value of animals in agriculture, (ii) The anatomy of farm animals and their position in biological classification, (iii) Animal conformation and the external points of horses and cattle, (iv) Methods and precautions in the administration of medicines to animals.

The subjects taken with the Second Year Class were: (i) Animal physiology, (ii) General care and management of animals and the principles of feeding, (iii) Vaccines and their value in the control of diseases, (iv) The application and use of the tuberculin test in tuberculosis control, (v) Breeding operations on the farm, (vi) Sterility in cattle, its causes and treatment, (vii), Castration and its physiological effect, (viii) The causes and treatment of pneumonia, diarrhoea and intestinal worms in young animals.

Subject matter of Third Year Class dealt with: (i) General characteristics of communicable and non-communicable diseases, (ii) Wounds and wound infection, (iii) Methods of animal restraint, (iv) Veterinary obstetrics, (v) Commoner diseases of the foot, bones, joints, respiratory, digestive and genito-urinary organs, (vi) Unsoundnesses, blemishes, and vices, (vii) The general principles of sanitation and the prevention and control of infectious diseases, (viii) Some of the commoner parasitic and infectious diseases of farm animals, (ix) Horse-shoeing, (x) Determination of age.

2. GOVERNMENT STOCK FARM AT HOPE.

1. *Tuberculosis of Cattle*.—Ever since the cattle of the Farm were found by tuberculin test made in January, 1927, to be infected to the extent of 5.56 per cent. sustained efforts have been made to eradicate the disease from the herd.

The annual test of 1930 comprised all the cattle on the Farm except 10 newly-born calves and resulted as follows:—

Date.	Number Tested.	Result.
August.	320 head.	No reactors.
October.	Six working steers added to the herd.	No reactors.

A comparative statement of tests made since January of 1927 is submitted to show the progress made in the control of the disease on the Farm:—

Month.	Number Tested.	Result.	Percentage Infection.
Jan., 1927	359 head.	20 reactors.	5.56%
July, 1927	303 head.	1 reactor	0.33%
Dec., 1927	312 head.	1 reactor	0.32%
Nov., 1928	297 head.	1 reactor.	0.33%
Oct. 1929	342 head.	1 reactor.	0.29%
Aug. and Oct., 1930	326 head.	No reactors.	Nil.

2. *Tick Fever (Tiroplasmosis—P. bigemum)*.—Systematic dipping of the Farm cattle every two weeks was maintained throughout the year. Although this practice has been in operation for several years, tick infestation of a small or limited extent still persists and is in large measure due to the location of the Farm. It frequently happens that ticky cattle from lands adjacent to the Farm break or stray into the Farm pastures, etc., and on other occasions the Farm cattle break out into ticky pastures of adjoining holdings. As there is no prospect of altering these conditions, it is evident that the tick menace can be dealt with only by constant attention to the regular dipping of the Farm cattle.

The incidence of acute forms of Tick Fever on the Farm was small, namely five acute attacks in three animals as follows:—

(i) Imported Jersey bull, "Victor"—two attacks on January 15th and March 10th. Treated with trypan blue on each occasion and recovered.

(ii) Imported Guernsey bull, "Foremost Monogram"—two attacks on March 12th and 19th. Recovered with trypan blue treatment.

(iii) Native born Red Poll heifer, "Rubriska," was discovered in an advanced stage of the fever and immediately treated with trypan blue but died within 36 hours.

In addition to the above, twenty-two cases of low type or chronic fever were treated with trypan blue.

3. *Blackleg (Clostridium chauvei)*.—No cases of this disease occurred on the Farm during the year.

Since 1927 annual vaccination against this infection has been practised as a protective measure against possible latent Farm infection, but more especially to safeguard the lives of young cattle when sold off the Farm and moved into infected parts of the Island.

Vaccination of 1930 consisted of the treatment of all cattle under three years of age (128 in number) with Black-leg Aggressin as the immunizing agent administered between May 22nd and 27th.

4. *Intestinal Worms of Calves (Ascaris)*.—This condition which is common and severe on many cattle properties in the Island is not a very serious trouble at Hope. This is probably due to the fact that nearly all the calves are hand-reared and fed in a barn which is cleaned and washed daily.

In spite of these precautions, however, a few of the calves in August showed worm infestation. The entire group of 51 head were promptly treated with thymol.

5. *Parturition Record of the Cattle for the Year*.—(i) There were 118 living calves, 4 still births and 4 aborted foetuses.

Of the 118 living calves five were destroyed—one because of deformity, two on account of congenital weakness and two grade male as no sale could be effected.

(ii) Eighteen cases of retention of the foetal membranes were treated during the year. Of these three died from ensuing septic metritis.

6. *Obituary List of Farm Cattle*.—Exclusive of calves destroyed as mentioned before, the following deaths occurred:—

Animal.	Cause of Death.
1. Jersey Cow, "Pansy B."	Internal injuries inflicted by companion cow in pasture.
2. Red Poll Heifer, "Rubriska."	Acute Tick Fever.
3. Grade Cow, "Monica 6th."	Septic metritis as a sequel of retention of foetal membranes.
4. Grade Cow, "Mirage 3rd."	
5. Aberdeen Angus Cow, "Missy."	
6. Saysa's Calf, "Ida."	Acute gastritis

FARM POULTRY.

1. *Tuberculosis*.—As stated in Report of 1929, infection of the flock with tuberculosis was discovered in January of that year. Subsequently three intradermal tuberculin tests were applied to the flock and 1 cock and 12 hens found infected by the tests.

On February 13th-15th of this year the flock then consisting of 4 cocks, 26 hens was again tested and two positive reactors (hens) discovered and destroyed.

2. *Hemorrhagic Septicaemia (Fowl Cholera)*.—This disease did not affect the poultry this year. On May 20th all the birds were treated with Hemorrhagic Septicaemia Aggressin as a precautionary measure. This practice has been maintained annually since 1927 by reason of the occurrence of the disease in 1926. Since employing this procedure, little or no loss from cholera has been sustained.

3. GOVERNMENT STUD FARM, GROVE PLACE, MANCHESTER.

Horsekind.—1. The horsekind belonging to the Farm during the year were: (i) two stud animals, namely, "Royal Highness," imported thoroughbred stallion, and "Kentucky Boy," imported jack.

(ii) Eight brood mares, four fillies, two geldings, eighteen young mules, five mule cubs, two jennies and three donkey cubs.

2. The losses sustained in the year were:—gelding, "Pirate,"—destroyed because of an incurable infection of the plantar cushion. Mare, "Quality," from rupture sustained during coitus. Mare, "Blossom," from colic. Quality's mule cub from congenital weakness. Donkey cub "Dove," from malnutrition.

3. Psoroptic Mange on the Farm—This condition confined exclusively to the brood mares and fillies has required and received constant attention throughout the year. By the systematic use of Arsenite of Soda and Paranaph solution in the form of baths all affected cases, except two of long standing, have apparently been cured.

Cattle.—1. The general health of the cattle during the year was good. Regular dipping for tick control was maintained as in past years. No cases of tick fever occurred among the stud bulls or Farm cattle.

2. Tuberculosis.—Between July 8th-12th, the intradermal tuberculin test was applied to all the Farm cattle and no reactors to the test were found.

As shown below this is the third clean tuberculin test which the Grove Place herd has passed.

TESTS:—

Date.	Number Tested.	Result.
November, 1924	214	No reactors.
April, 1927	420	No reactors.
July, 1930	162	No reactors.

3. Blackleg.—No cases of this disease occurred during the year.—All the cattle of susceptible age were treated with Blackleg Aggressin in conformity with the practice of annual vaccination instituted several years ago subsequent to losses from this infection.

4. Parturition Record.—There were forty nine normal calves dropped, two still births, one deformed calf and two fatal cases on dystokia.

5. Death list of Cattle for the year is:—

1. Grade Cow, "Manna," Destroyed because of incurable joint infection.
2. Grade Cow, "Flighty," from dystokia.
3. Grade Cow, "Helen," from prolapse of the uterus.
4. Grade Cow, "Wink," from injuries to the spine.
5. Aberdeen Angus Cow, "Hope Missy," from dystokia.

4. DISEASES UNDER THE CONTAGIOUS DISEASES ANIMALS (INLAND) LAW.

Only seven reports of the suspected occurrence of these notifiable diseases were received by the Department during the year, namely, two of foot and mouth disease, three of anthrax and two of swine fever.

(i) *Foot and Mouth Disease*.—The two reports of the year were promptly investigated with the following results:—

No. 1 involving goats exclusively on peasant holdings around Lacovia, St. Elizabeth, proved to be a general verrucous condition of the muzzle, especially the lips, of goats feeding on spinous vegetation.

No. 2 was a moist eczematous eruption of the lips and lower parts of the limbs of a few steers on an estate near Morant Bay, St. Thomas, caused by excessive feeding on guango (*Pithecolobium*) pods.

Since the last outbreak of foot and mouth on and around Midgham Estate in Westmoreland (the Midgham outbreak) in June-July, 1926, the Island has been free of the disease.

(ii) *Anthrax*.—No reports were received this year from the parts of St. Elizabeth which in 1928 and 1929 were visited for investigations of rumoured mortality of cattle from anthrax. As stated in Report of 1929, investigation incriminated blackleg in some instances, but chiefly plant poisoning (*urichites*) in the seasons of drought. The three reports of the year investigated were:—

(a) On a sugar estate in Trelawny where autopsy findings were negative for anthrax but the cattle were recently exposed to *urichites*.

(b) On a property in the mountains of northern St. Elizabeth where bloody diarrhoea of a few young cattle was the trouble.

(c) On a property in Manchester where the only case available for examination showed sepsis from post-parturient complications.

(iii) *Swine Fever*.—Two outbreaks of what is generally called "hog sick" were reported in Portland—one at Moore Town, the other in the Kensington District.

When Moore Town was visited only one sick pig could be secured for autopsy, and as the lesions were not sufficiently diagnostic for swine fever the disease was not declared under the Law. No investigation was made in the Kensington District.

5. TICK CONTROL.

1. No general inspection of cattle or dipping tanks was done during the year. Judging, however, from the sales of Paranaph and Arsenite of Soda to owners of registered tanks from the Government Laboratory, it is safe to say that dipping is being practised on many of the cattle properties.

	1927.	1928.	1929.	1930.
Sales of Paranaph	29,954	37,353	37,849	33,512lbs.
Sales of Arsenite of Soda	17,475	21,900	21,725	20,175lbs.

2. Number of registered tanks:—

1928.	1929.	1930.	Increase.
305	329	341	12

6. DEPARTMENTAL ASSISTANCE.

Veterinary assistance was rendered by the Department in connection with the following diseases:—

- (i) *Epizootic lymphangitis*.—Tentative treatment of P.W.D. mules by intravenous injections of Biniiodide of Mercury solution.
- (ii) *Tuberculosis*.—Tuberculin tests of dairy cattle at the requests of owners as summarized below:
Seven groups. 205 head tested. Result: One positive reactor.
- (iii) *Tick Fever*.—Treatment of three imported bulls during acute attacks of fever and one outbreak among native cattle.
- (iv) *Dysentery of Calves*.—Investigation and treatment of persistent recurrences on two properties.

7. ASSISTANCE IN EDUCATION.

- (i) Lecture on Tuberculosis of Farm Animals to Agricultural Instructors at their Annual Course in January.
- (ii) Ten lectures on Meat Inspection in the School for Sanitary Inspectors during October and November.

8. INSPECTIONS OF EXPORTED AND IMPORTED ANIMALS.

- (i) Export Certificates were given for:—One gelding and three mares to the United States, one Red Poll bull to Colombia, one Nellore bull to Guatemala, one dog to the United States and one dog to Canada.
- (ii) Certificates for Landing under Law 24 of 1890 were given for:—Horses—Three racing mares from the United States. Cattle—Six pure-bred bulls—one Shorthorn from United States, one South Devon and one Aberdeen Angus from England, two Holsteins from Canada, one Holstein from United States. Two pure-bred Holstein heifers from Canada. Swine—Two swine from Canada. Dogs—Twenty-six dogs from England.

9 THE PROTECTION FROM DISEASES (BEES) LAW, 1918.

No recurrence of American Foulbrood has occurred during the year.

The last outbreak occurred in July of 1926 and entailed the quarantine and systematic inspection of all apiaries within the area of Lower St. Andrew and Kingston until March 31st, 1928.

S. LOCKETT, V.M.D.,
Govt. Veterinary Surgeon.
Jan. 31st, 1931.

V.—PLANT DISEASES AND PESTS.

Report of the Secretary of the Advisory Committee on the Banana Industry.

The membership during 1930 was:—Director of Agriculture (Chairman), Hon. J. H. McPhail, Hon. P. Lindo, Hon. T. J. Cawley, Messrs. F. A. Cory, J. R. Johnson, G. J. Goble, the Secretary, Jamaica Agricultural Society, the Supervising Inspector of Plant Disease and the Government Microbiologist (Secretary). Hon. K. V. Abendana was appointed to the Committee during the year. The following members were granted leave: Hon. J. H. McPhail, Hon. P. Lindo, Mr. Goble and the Secretary. The Entomologist acted for the Secretary during his absence in Canada.

Three regular meetings were held during the year and one special meeting was held in Port Antonio to hear the views of the Portland planters on the future of Panama Disease control in that parish. As hitherto, the less important matters have been dealt with by means of circulated papers, sixty-four of which were issued during the year.

During March and April the Committee met on three occasions to consider the future policy in Portland. After meeting the Portland planters and considering every aspect of the situation, the Committee finally recommended to the Governor in Council that Government treatment of the disease should be suspended for a year and planters, large and small, allowed to treat the disease themselves, the amount of bananas other than the diseased root to be destroyed being left entirely to the owners' discretion. The Privy Council agreed to this arrangement being given a year's trial when the situation might be reviewed once more. At the request of the Portland planters, two Inspectors were left in the parish to continue propaganda work and to continue a general inspection of the parish. During the year these Inspectors have distributed some 45,000 grapefruit plants to planters and settlers in the parish and these were provided without charge.

Realising the need for more detailed work on the problems arising in connection with the banana breeding work, the Committee recommended the appointment of a Geneticist. This suggestion received the approval of the Governor and the Legislative Council and preparations are being made for rapid expansion of this very important work.

The large scale experiments on Panama Disease control in relation to various sized quarantine areas were continued and an interim report submitted by the Microbiologist. It has been decided to continue these experiments for another year to obtain more conclusive results.

Other experiments which have been carried out in connection with Panama Disease and its treatment are described in the Report of the Microbiologist.

With the suspension of Government treatment of disease in Portland, reporting of the incidence of the disease in that parish has been suspended so that in future the summaries will contain only the incidence in parishes other than Portland. The summary for 1930 is appended.

F. E. V. SMITH,
Microbiologist. Secretary to the Committee,
27.1.31.

Summary of Incidence of Panama Disease in parishes other than Portland in 1930:

Parish.	Diseased Plants.	New Cases.	Recurrences.	Total Cases.
St. Mary ..	45,281	806	28,042	28,848
St. Thomas ..	6,048	517	2,893	3,410
St. Ann ..	3,413	193	1,371	1,564
Trelawny ..	664	13	207	220
St. James ..	8,009	276	2,590	2,866
St. Catherine ..	4,111	414	2,193	2,607
Hanover ..	625	28	279	307
Clarendon ..	4,025	345	1,309	1,654
Manchester ..	116	25	53	78
Westmoreland ..	931	32	517	549
St. Elizabeth ..	3	1	1	2
St. Andrew ..	89	20	16	36
Total 1930 ..	73,315	2,670	39,471	42,141
Total 1929 ..	36,661	2,417	18,224	20,641
Total 1928 ..	17,005	1,776	7,987	9,763
Total 1927 ..	11,088	1,193	4,822	6,015
Total 1926 ..	6,785	759	2,199	2,958
Total 1912 to 1930 (excluding Portland)	153,061	10,012	75,063	85,075

MONTHLY TOTALS.

January ..	6,223	269	2,965	3,234
February ..	7,360	302	3,722	4,024
March ..	7,004	269	3,665	3,934
April ..	6,513	250	3,561	3,811
May ..	5,670	248	3,235	3,483
June ..	6,107	216	3,704	3,920
July ..	5,262	176	2,903	3,079
August ..	5,652	127	2,978	3,105
September ..	6,225	222	3,275	3,497
October ..	6,248	213	3,498	3,711
November ..	5,192	196	2,727	2,923
December ..	5,859	182	3,238	3,420
Total for year ..	73,315	2,670	39,471	42,141

F. E. V. SMITH, Microbiologist.
27.1.31.

PLANT DISEASES IN JAMAICA IN 1930.

Report of the Government Microbiologist.

The earlier months of the year were largely spent in continuation of the investigation of the conditions associated with storage troubles in bananas and some interesting data were obtained. A visit was made to Canada and the United States in connection with the same subject which resulted in the elucidation of several matters. In this respect, I desire to record my appreciation of the collaboration of Dr. H. T. Gussow, Dominion Botanist and Head of the Canadian Plant Disease Service. The decision of the Government to leave the investigation of all banana storage troubles to the research workers in Trinidad brought this investigation to an end while it was still incomplete. The facilities which exist at the Imperial College for the investigation of cold storage problems should rapidly help to throw more light on these rather complicated problems.

The Entomologist continued the work of this Division during my absence in Canada and I acted for him during his leave in England.

GENERAL.

Most parts of the Island have suffered from drought during the summer and in many districts the autumnal seasons have been late and scanty. Such conditions of weather have produced a marked check, in some diseases during the later months of the year.

Recent developments in co-operative marketing coupled with increased shipping facilities both to Europe and Canada have produced a greater interest all round in the health of crops. In consequence there have been additional demands for information about citrus and other diseases. The formation of the Jamaica Direct Fruit Line has brought the Producers' Associations into direct contact with the troubles which arise in cold-storage fruit and collaboration between those responsible for shipping and the Microbiologist has continued throughout the year.

Many planters are now paying attention to minor crops which appear to have possibilities for export in the future. Increased interest of this sort on the part of planters tends to bring diseases of such crops into greater prominence and it is obvious that greater demands will be made upon the Microbiologist in this way each year. Frequently enquiries are made about diseases which are merely the result of improper care or cultivation of the crop concerned. Whenever possible these points have been fully investigated and advice concerning the disease has been coupled with general advice regarding the growing of the crop.

BANANAS.

Panama Disease. (Fusarium cubense, E.F. Sm.)—From my Report as the Secretary of the Advisory Committee it will be seen that the Government treatment of the disease in Portland ceased in March, 1930 and although the parish is still supervised by two Inspectors the incidence of the disease is no longer recorded there. In the other parishes the disease did not show the usual increase during the later months of the year. Weather conditions always have a large bearing on the speed of development of the disease and the general drought and scanty autumnal seasons have undoubtedly caused a considerable delay in the exhibition of symptoms which will become more prominent in the early months of 1931.

In spite of this the incidence was 100% more than in 1929 but the bulk of the increase occurred in one or two parishes. In the parish of Hanover the disease remained almost at a standstill. A considerable number of sporadic cases occurred in the irrigated plains of St. Catherine and Vere but with a few exceptions the disease has not shown any great inclination to spread rapidly from these foci.

Experiments on Quarantine.—With the exception of Portland the treatment and quarantine have been maintained as before but a series of experiments is being carried out to test fully the effect of reducing quarantine. These experiments when complete will be a useful basis for determining future policy and will also give some interesting data on the rate of dissemination of *Fusarium* diseases on soils of different types under an assortment of conditions of soil, rainfall, flooding and drought.

Tests of Disinfectants and Lime.—At the request of the Director of Agriculture a special series of experiments were carried out in the field to test the efficacy of various disinfectants for use in the treatment of Panama Disease and to investigate the action of lime on diseased material. A full report has been submitted on these experiments which showed that from careful isolations of organisms present in treated and untreated material it was quite apparent that a 10% solution of Jeyes Fluid or 10% Septol were superior to the normal concentrations of such disinfectants as Corrosive Sublimate, Bleaching Powder and Formalin. The action of lime on diseased banana material was carefully tested and while there was no indication of any fungicidal action by the lime it was quite apparent that there was a definite inhibition of growth of the fungus on diseased material treated in this way. No doubt the more rapid destruction of the tissues by the application of the lime and the consequent loss of substances which would normally figure largely in the 'diet' of the fungus is responsible for this restriction of growth of the organism. The investigation of the fungus flora of soil adhering to the boots of those working around a diseased plant proved the necessity for the complete cleansing and the removal of all soil before disinfection is made otherwise the operation is entirely valueless.

Killing of Bananas with Chemicals.—During recent years there has been a growing demand among planters for a chemical of reasonable price which when applied to banana roots would be effective in killing them. Such a method if applied to the regular Panama Disease treatment would reduce the amount of labour and time taken in treating cases while preventing the loosening and disturbing the infected soil which normally takes place in digging out the roots, with the possible consequences of distribution of infection. Experiments were made in the past by Hansford who found that Sodium Arsenite effectively killed the banana but its lasting toxic effect upon the soil and its poisonous nature preclude this chemical for general use. At the request of some of the members of the Advisory Committee further investigations have now been made with very satisfactory results. At the outset several chemicals were tested at varying concentrations but the only one which proved to be at all effective was Kerosene Oil. This oil at 1 to 2 gallons proved quite satisfactory but prohibitive in price for the purpose. All the available mineral oils were put to trial, ranging from Fuel Oil of Sp. Gr. 0.970 to Kerosene and some blends of the different fractions. It was found that the heavier oils were entirely useless. Even at 2 gallons per root the banana suckers grew through the oil unharmed. The oil which is known in the trade as Heavy Gas Oil (Sp. Gr. 0.850—0.858; Flashpoint 181° F.) proved absolutely effective in large quantities. A wide range of experiments have been made with this oil under conditions of heavy clays with high rainfalls and on light irrigated land with extremely satisfactory results. It has been found when the bananas are cut off about six inches above soil level and the oil applied to the cut surface and the surrounding soil that almost 100% killing may be obtained with from 1½ to 4 pints of the oil, the quantity varying with the size of the root to be destroyed. Such a treatment costs 1d. to 2½d. per root according to the amount used. A test of the fungicidal action of this oil was also made but its effect in this respect was small. It has a marked inhibiting effect on the growth of *Fusarium Cubense* on treated tissue however, similar to that produced by lime, in fact the destruction of the banana tissue when treated with this oil is more rapid than when lime is used. This method is now being adopted experimentally by several planters and definite figures of the total cost of treatment by this method will soon be available.

Other Banana Diseases—Bonnygate Disease (*Sphaerostilbe Musarum*, Ashby) continues to be prominent in certain river valleys owing to the reluctance of planters and settlers in these areas to replant their fields. Black Spot (*Cercospora musarum*, Ashby) has been conspicuous in some places on the leaves and the small 'pin-head' black spots on the fruit, also attributed to *Cercospora* but with questionable accuracy, have been very common in certain irrigated areas and some cold hilltops during the autumn. This marking of fruit becomes apparent in the autumn each year and appears to be associated with conditions of incorrect drainage especially upon clay lands which are liable to become cold. Investigations are in progress but as yet it has not been possible to definitely identify the trouble with the presence of *Cercospora* or to obtain positive results from inoculations. The disease certainly requires further investigation and will receive greater attention during the coming year.

Several individual plants have been seen during the year which exhibit the peculiar freak appearances described in previous reports. These are restricted to plants under irrigation. Occasional cases of bacterial disease occurred. Marasmius disease was not uncommon in "Bush" bananas.

SUGAR CANE.

Mosaic still continues to be found on most estates but its effect is less pronounced generally especially where routine roguing takes place. *Root Disease* (*Marasmius sacchari*, Wakk.) has become much more noticeable recently on some estates where depression in the industry has necessitated less attention being paid to cultivation and replanting. Where cultivation is maintained at a high standard [root diseases are almost unknown.

Imported cane-tops growing in quarantine have been regularly examined. It is pleasing to be able to report that the Island is still free from Gummosis, Pokkah-Boeng, and Leaf Stripe. It is hoped that by continuous enforcement of the Plant Protection Regulations these diseases will not be allowed to enter the Island.

Matters relating to sugar are reported under Fermentation.

COCONUTS.

The general health of this crop in the districts most suitable to its cultivation has remained at a high level. *Bud Rot* is now almost unknown although an occasional case has been noted. *Red Ring Disease* is still quite unknown in Jamaica.

A great deal of confusion still exists among planters as to the nature of some of the *Leaf Troubles* in coconuts.

There are several districts in the hills of St. Andrew and other parishes where a great deal of leaf discoloration has been taking place in recent years. In the first place it has to be realized that most settlers and not a few planters are of the opinion that coconuts will grow luxuriantly and maintain a maximum production in any situation irrespective of rainfall and soil. This is a most fallacious idea. The coconut, while being a moisture-loving plant, is most susceptible to the presence of stagnant water in the soil and shows a great dislike for clay, at the same time it will show a rapid set back under conditions of low rainfall. The effect of any of these conditions is ultimately much the same physiologically and the result is invariably a premature discoloration or death of individual leaves which then become especially attractive to certain fungi and scale insects. Usually the necrotic portions of such leaves bear fructifications of *Pestalozzia palmarum*, Cke. and *Diplodia* spp and are often infested by *Asterolecanium palmarum*, Ckll. At times similar symptoms appear which are free from fungi or insects. It is not unusual to find splitting of portions of the petiole from gum formation but careful cultural work on such lesions has shown that the tissues from which the gum arises are quite sterile and although abundant growth of *Pestalozzia* may be found on the outside of the lesions it has no connection with the production of the gum or the lesion itself. All experimental work and investigation of affected trees up to the present below ground as well as above have definitely shown that the organisms mentioned above are not in any way responsible for the primary symptoms in the trees. Further, no signs of fungus invasion of the root systems have been visible but where unhealthy roots exist they merely show signs of disorders of a physiological nature. In other words this is not a disease in the accepted sense of the word in that it is not a transmissible or infectious disorder but it is a physiological response to unsuitable or abnormal conditions of soil, rainfall or drainage. Generically it may be classed perhaps with the Bronze Leaf Wilt and similar diseases of Trinidad but the usual symptoms are far from being in agreement with those described by Britton-Jones and others. It is possible that the conditions of climate and soils are not so severe upon the coconut trees in this Island and in consequence although the contributing factors are similar to those in Trinidad yet they are not sufficiently severe to produce such marked results in the trees.

It is not possible to lay down any hard and fast rules for the treatment of such leaf troubles. It is always desirable to remove the diseased leaves and to clean up the trees generally but beyond that the treatment depends entirely on the contributing conditions in each case. When trees are growing on almost bare rocks or ridges in areas which suffer from periodic drought one can only recommend careful treatment of the trees and application of mulch with regular imprecations on the Clerk of the Weather. Where groups of affected trees appear in the middle of an otherwise healthy grove it is usually found that there is an upthrust of clay or toxic subsoil. In such cases attention to drainage and the incorporation of manure in the surrounding soil will give a rapid amelioration of the trouble. Except where bananas are grown between the rows, coconuts normally receive no cultivation but the trees make a ready response to a little care in this way and frequently it is recommended that a couple of crops of bananas be grown in a grove which needs to be brought back into condition. The danger of advice of this sort lies in the bananas being made ultimately into a main crop and the coconuts taking second place with the result that neither does well.

CITRUS.

Interest in the diseases of these crops has increased considerably during the last two years with the advent of co-operative marketing and the prospect of more remunerative prices. There has also been a revival of interest in limes during the year.

Scab.—(*Sporotrichum citri*, Butl. and Doid.) has been prominent in all sour orange nurseries and several cases have been noted on lemons of various varieties. This disease has been kept in check quite well in nurseries by regular sprayings of Bordeaux Mixture provided such spraying has been made a routine from the time when the first rough leaves appeared. Where control has not been attempted until a later stage considerable advantage has been obtained by pruning back the badly affected shoots before beginning to spray. To obtain healthy nurseries it is essential that all sour orange trees in the immediate vicinity be destroyed before sowing seed. *Withertip* has been general but not often severe on limes in certain types of locations. *Withertip* in grapefruit and oranges is comparatively uncommon but two young mixed

groves were badly affected. Most of the trees had been budded on grapefruit stock and the Triumph variety on this stock was severely affected while Marsh Seedless grapefruit showed less attack and Washington Navel Orange on the same stock showed least of all. There had also been excessive and unbalanced manuring but making due allowance for this, it is quite clear that the common grapefruit stock is too strong a grower for general purposes and especially for the weaker growing varieties of grapefruit such as Triumph. On the whole, the sour orange stock although a little slower is by far the best stock for general purposes and the production of healthy trees. Cases of *Scaly Bark*, *Gummosis*, *Foliocellosis* and minor troubles have been noted from time to time but generally in old trees dating from the time of the Florida 'Freeze' when a great deal of planting of trees on lemon stock took place. *Knot* (*Sphaeropsis tumefaciens*, Hedges) is practically restricted to limes. Many severe cases have been seen or reported recently especially where planters are paying attention to old trees in pastures. An attempt to protect young trees by spraying is being made but the methods of lime growing generally do not lend themselves to disease control. In some cases, however, it is possible to do some cleaning up of trees by pruning. *Diplodia Rot* (*Diplodia natalensis*, Evans) still produces considerable loss to growers in some particular areas. The control of this very destructive rot is difficult except when it is possible to attack it in the field by general cleaning up of trees. Further work is in progress on the treatment of fruit for its control but at the present time satisfactory results have not been obtained.

DISEASES OF OTHER CROPS.

COFFEE. *Damping off* (*Rhizoctonia solani*, B. and G.) is still common in the nurseries but responds well to Cheshunt Mixture. Occasional cases of *Black Rot* (*Rosellinia* sp.) and *Omphalia flavida*, have been noted. TOMATO. *Leaf Mold* (*Cladosporium fulvum*) and *Late Blight* (*Phytophthora infestans*) are the two principal diseases. The former was more common in autumn and spring while the greater damage from *Phytophthora* occurred in the colder months. *Mosaic* is common in some places.

IRISH POTATO.

Common Scab (*Actinomyces*) has been serious in some of the light red Manchester soils that are deficient in humus. Of the leaf diseases *Early Blight* (*Macrosporium solani*) was most serious and showed less response to spraying. *Late Blight* is rarely serious except in the hills where the temperature is more within the optimum range of the parasite. Occasional attacks by *Rhizoctonia solani* have been noted but the damage was of little consequence. *Sclerotium Rolfsii* has been recorded during the year on this crop, causing damage to the stems at soil level.

TABACCO.

Mosaic is still the most serious disease of this crop and it can be found in all forms. It is peculiar that while *Mosaic* is so common on tobacco and many other crops, it and all virus diseases are almost unknown on Irish potatoes. The fact that all seed imported is of high standard and usually of virus-certified stock has a large bearing on this but it is also possible that the higher temperatures may cause some masking in potatoes.

PAPAW.

The *Mosaic Disease* of this crop which results in a dwarfing of leaves and the production of 'pencil point' has also been described by Ciferri from the Dominican Republic. It has been still very noticeable all over the Island and would be the limiting factor to papaw growing on a commercial scale. Should this crop be developed commercially at any time it would be necessary to search for an immune variety. Casual observations would suggest that there may be such a variety.

MAIZE.

One very serious case of *Smut* (*Ustilago maydis*) has been investigated, while several minor infections have been observed.

The following diseases have also been observed during the year:—

ROSE. *Powdery Mildew* (*Sphaerotheca pannosa*) and *Black Spot* (*Diplocarpon rosae*).

BROAD BEAN. (*Heterodera radicicola*) This eelworm has been common on many hosts: CABBAGE, Downy Mildew (*Peronospora parasitica*).

BET. Leaf Spot (*Cercospora betae*)

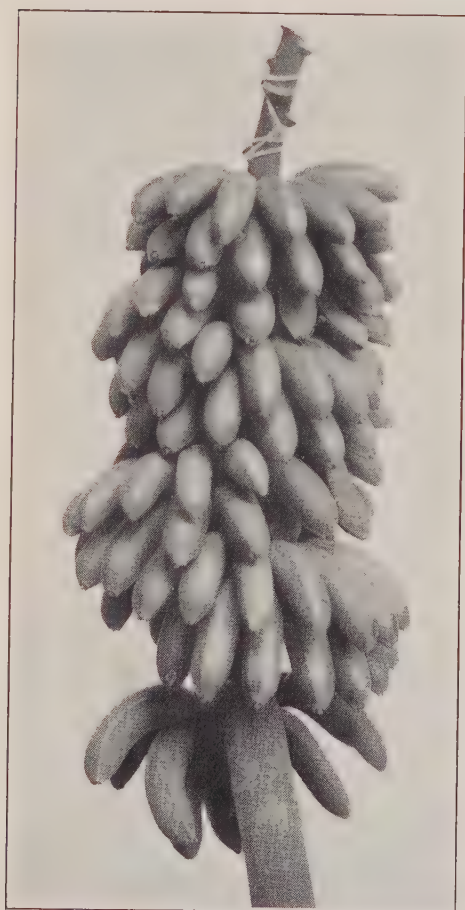
VINE. Downy Mildew (*Plasmopara viticola*) and Shank.

GREEN PEA. Root Rot (*Aphanomyces euteiches*). Several of the minor diseases reported in previous years have been noted in addition.

Chlorosis on marl or limestone land is very marked especially in bananas. It occurs only in very small patches usually.



MAKING SILAGE. HOPE FARM.



SEEDLING IMMUNE BANANA
(Gros Michel x Robusta).



ASYMBIOTIC METHOD—ORCHID SEEDLINGS.

FERMENTATION WORK.

There has been no demand for pure culture work for rum making.

A case of peculiar frothing of cane juice as it left the mill was carefully investigated but it was found that neither bacteria nor yeasts were responsible. It was finally attributed to excessive colloidal matter in the canes which had suffered severely from Root Disease.

At the request of the Sugar Board a special investigation is being carried out into the possible means of utilising locally made white sugar for preserving and canning purposes. Very satisfactory results have been obtained in making marmalades from grapefruit and sour orange and these preparations have kept well without fermentation for six months. The Jamaica fruit has proved to contain a very high percentage of pectin, which makes it admirably suited for marmalade making. It would seem that the difficulty experienced from fermentation of preserves by *Torula* sp. is due to insufficient pectin content in the final product; in other words, to insufficient boiling previous to the addition of the sugar. Provided a final product of boiling point 221° F is obtained there appears to be no fermentation. Experiments on canning have not been carried far on account of the lack of necessary apparatus but it is hoped to carry out experiments in the coming year in collaboration with the Citrus Producers' Association. A full report on this work is in preparation.

ORCHID RAISING.

The raising of seedlings of Cattleyas and other orchids from seed produced in the Gardens by the Horticulturalist has continued and very satisfactory results have been obtained. Agar has been abandoned as a substratum and a most satisfactory method has been worked out which is easy and gives excellent germination and growth. In several instances large quantities of seedlings nearly an inch high with well developed roots have been raised in six months from the time the seed was sown. A full description of the method is being given in a paper which is being prepared for publication elsewhere. Pulped filter paper is used as the basis of the medium and this is wetted with a nutrient solution based on that used by Knudson for making agar for the same purpose. The medium is sterilised and used in 250cc. Erlenmeyer flasks. Seed is sterilised in Bleaching Powder solution (saturated) for about one to two minutes and then spread on the medium with a flattened glass rod. The flasks are finally sealed with paraffin wax. The method should appeal to the amateur as it is simple and eliminates the necessity for tedious methods of agar preparation while giving equal if not superior results. Flasks of various hybrids are illustrated, one being of seedlings which have been 'pricked out.' Success has been obtained with seventeen different crosses, including one bi-generic cross. There have been comparatively few failures and these were due to infertile seed. A full description of the crosses will be given in the full paper on the subject.

INSPECTIONS.

The inspection of seed potatoes for the Agricultural Society has been carried out as usual and it is pleasing to record the high standard of health of tubers imported from Canada. Through the kind assistance of Mr. T. Anderson, of the Scottish Board of Agriculture, the importation of Epicure seed from Scotland this year was of a very high standard. Sundry inspections of imported plants and disinfection of implements was carried out. One consignment of plants from Nigeria was destroyed. Health certificates for plants for export have been issued when necessary and after the necessary inspection.

PUBLICATIONS, &c.

Several minor articles have been contributed to the Journal of the Agricultural Society and a Bulletin on Coconut Diseases is in preparation. A paper on asymbiotic growing of Orchids is also in preparation. A paper on the Diseases of Jamaica Crops is in the hands of the Director of the Imperial Bureau of Mycology.

A Plant Disease Museum has been started on a small scale during the year and is being added to continually.

F. E. V. SMITH,
Government Microbiologist.
30.1.31.

Report of the Supervising Inspector of Plant Diseases.

Experiments in connection with banana breeding for the year 1930 have been carried out at Castleton Gardens, the District Prison at Spanish Town and the Government Laboratory at Hope.

In September four acres of land at Caymanas Estate were kindly placed at our disposal for further experiments and have been planted out with seedlings which we hope to re-cross to the Jamaica variety so as to obtain a fruit with long fingers.

CASTLETON GARDENS.

At Castleton pollination of bananas has been carried out on two plots and at present another acre of Jamaica Bananas is being planted for purposes of pollination.

Heavy Northers in November did serious damage to the pollinated bunches which had then nearly matured. Several hundred seeds were produced but up to date only nine of them germinated. Pollen from the seedling varieties has been transferred to the Jamaica and Robusta varieties. Five plants have already grown from the seeds of the No. 7 Seedling re-crossed to the Jamaica variety. As many as twenty-two fertile seeds have been produced from one No. 7 Seedling banana crossed by the Robusta.

A variety known as "Sucrea" was crossed with the Robusta and produced two seeds. The "Sucrea" variety produces a bunch of 12 to 15 hands but with short fingers.

SPANISH TOWN DISTRICT PRISON.

This plot was re-planted in September with the most promising crosses of the Jamaica with the Robusta. In re-planting, the poor fruiting varieties were rejected. This station supplied suckers with which the plot at Caymanas Estate was planted.

The suckers transferred from this plot in February, 1929 and planted in diseased areas in Portland and St. Mary are still flourishing whilst the suckers of the Jamaica or Martinique variety planted in the same areas at the same time have succumbed to the ravages of Panama Disease.

THE GOVERNMENT LABORATORY.

Here varieties Nos. 7, 13, 19, 40, 48, the most promising crosses of the Jamaica variety have all fruited and the immunity of these crosses to Panama Disease has now been well established.

The No. 7 variety has produced its fourth bunch—a nine hand—and the fingers are much improved in length but not yet up to marketable length. Two strange varieties of Jamaica Banana were tested and proved not immune to Panama Disease.

Two gentlemen were given permission to test their alleged cures for Panama Disease at this station. Each planted suckers of the Jamaica Banana and carried out his respective treatment but in two months the suckers showed symptoms of Panama Disease and the inventors abandoned their efforts.

Twelve suckers of the No. 7 Seedling variety planted in May, 1928 in infected areas at Bog Walk still remain immune to the attacks of Panama Disease.

J. B. SUTHERLAND,
Supervising Inspector of Plant Diseases
2.2.31.

Report of the Government Entomologist.

During the first weeks of the year Dr. J. G. Myers of the Imperial Institute of Entomology made a stay in this Colony and I had the advantage of following his researches and of accompanying him on his tour of inspection throughout the Island. I am convinced that these researches in connection with the biological control of insect pests in the West Indies will prove of the greatest value to Jamaica.

Dr. Myers having already communicated to the Director of Agriculture the results of his activities here, I will only mention that I am of the opinion that owing to the many factors which in Jamaica render the control by artificial methods of the Citrus Black Fly; *Aleurocanthus worlumi* (Ashby) very difficult, the contemplated introduction of parasites of that pest will be of great benefit to the fruit industries in this country.

During the same period Mr. A. Pickles, Entomologist of the Froghopper Investigation Committee of Trinidad, carried out special investigations on the Cercopids of Jamaica and was given accommodation in my Laboratory.

In May I left the Colony for London where I attended the Third Imperial Entomological Conference after which I was on leave for six weeks, returning to Jamaica in September. During my absence the routine work of the Entomological Division was continued by the Microbiologist.

I desire to record here my appreciation of the assistance given by the Director and Staff of the Imperial Institute of Entomology who spared no efforts not only in arranging the Conference but in giving every facility to the delegates for studying the problems which interested them. In this connection I am especially indebted to Dr. Thompson the Director of Farnham House Parasite Laboratories.

During the period under review the activities of the Entomological Division were chiefly centered on problems of economic importance and special attention was devoted to those pests affecting food crops mostly grown by peasant farmers. All opportunities were taken to visit their plantations and to advise them on the spot. An illustrated Bulletin on the Insect Pests of Sweet Potato and of Cassava was published and various articles were contributed to the Journal of the Agricultural Society with a view of popularizing entomological knowledge.

EXPERIMENTS WITH INSECTICIDES.

Trials with insecticides against the Lepidopterous larvae which frequently attack solanaceous and cucurbitaceous crops led to the conclusion that there was definite advantage in using Lead Arsenate as compared with other arsenites; under local conditions Calcium Arsenate often caused serious injury to the foliage of those plants which when treatment has to be applied, are in their most active period of growth.

On account of the almost insurmountable difficulty in having spraying properly carried out by the very unskilled labour generally available for such work it was found advisable in most instances to recommend the dusting of insecticides; that procedure is becoming popular amongst planters who would not have had recourse to methods of control entailing more difficulties in application. It is hoped that the encouraging results they obtain will be an inducement to their adopting on a larger scale progressive methods of insect control.

As it is felt that, especially from the economic point of view, the more important desiderata in connection with the Banana Borer, *Cosmopolites sordidus* (Gem) in Jamaica are:—

- (1) The prevention of infestation of new lands as it occurs through the planting of infested suckers and
- (2) for already infested regions; to prevent the insect attacking newly planted suckers before these have had time to develop healthy radicular systems; series of experiments were undertaken with a view to finding a practical method of freeing planting materials from the pest and also to find a deterrent that in infested lands would prevent the insect from attacking during the first month of their growth, newly planted suckers, as it is during that period that more serious damage is done.

These experiments which are being continued have formed the subject of separate detailed progress

reports and it suffices to state here that no encouraging results have yet been obtained with the various insecticides used. Submersion of sucker in water with a view to killing infesting borers has also proved impracticable on a large scale, not only on account of the economic factors involved but also, because contrary to what appears to happen elsewhere, the conditions prevailing in our streams cause a large percentage of the suckers so treated to be ruined by soft rots before the insects are destroyed.

The percentage of suckers so damaged unfortunately remained too high, for the possible adoption of that method on a large scale, even when during treatment important portions of the pseudo-stems of suckers are left emerging.

As it is imperative for the development of the citrus industry in this Colony, that planters should adopt methods for controlling scale insects in the groves instead of restricting their attention to the cleaning of infested fruits when these are to be shipped, advice was given accordingly. The point that, apart from the reduction in yield caused by those pests, fruits infested or damaged by scales will never compete successfully on open markets with clean fruits as produced by their competitors from other countries, was stressed on all occasions.

Various new insecticides used for spraying were tested; emulsions of tar distillate gave good results but the price remains prohibitive.

Outfits for fumigation of trees with HCN were ordered and experiments started in groves at Hope. Fumigation under tents have given promising results and treatment could be applied in daylight in the autumn, that method for scale insect destruction will be useful in regularly planted and cultivated groves and where food plants harbouring insect pests have been removed from near cultivated trees.

It is to be deplored that most of the citrus fruits produced up to the present are merely reaped from trees growing wild or in a semi-wild state, so long as this state of affairs persists the problem of insect control will remain a very difficult proposition.

The practice of controlling the Citrus Black Fly, *Aleurocanthus woglumi* by the Dougal Campbell Ant *Cremastogaster brevispinosa*, Mayr., var. *minutior*, For., is being combated as it has been found that though they destroy *Aleurocanthus* they foster and disseminate in those groves where they are introduced scale insects especially *Coccus viridis*.

To keep within the space allotted for this Report the insect pests dealt with during the year are merely listed hereunder:—

1. *Citrus*.—*Aleurocanthus woglumi*, Ash.
Coccus viridis Green.
Chrysomphalus aurantii, Mask.
ditto *aonidum*, L.
Lepidosaphes beckii Newn.
Chionaspis citri, Comst.
Aphids.
Snails and Slugs in young plantations.
The Bagworm *Oiketicus, abbottii*, Grote.
2. *Coffee*.—*Coccus viridis* Green.
Saissetia hermispheerica, Targ.
Leucoptera coffeella, Staint.
Amphicerus terebrans, Pall.
3. *Cacao*.—*Heliothrips rubrocinctus*, Giard.
4. *Corn and Fodder Grasses*.—Army worms damage was less noticeable than during the previous year, severe drought having not occurred in the regions usually infested.
- Sugar Cane*.—The Sugar Cane Looper cutworm *Mocis repanda*, F.
- Sweet Potato*.—*Correocoris fuscus*, Thumb.
Cylas formicarius, F. var *elegantus* Sum.
- Cassava*.—*Erinnysis ello*, L.
Red Spiders.
- Cabbage*.—*Plutella cruciferarum*.
Precis monuste, Linn.
Rhopalosiphum persicae, Sluz.
- Tomato*.—*Chloridea obsoleta*, Fab.
Protoparce sexta jamaicensis Br.
Nezara marginata.
- Cucurbitus*.—*Diaphania hyalinata* Linn.
- Coconut*.—*Asterolecanium palmarum* Chll.
Oiketicus abbottii Grote.
- Mango*.—*Heliothrips rubrocinctus*, Giard.
- Stored Products*.—*Lasioderma serricornis* Fab. destroying tobacco in a curing barn.
- Pimento*.—*Aleurodicus pimientae*.
Frogatella pimientae Newstead
Llaevia pimientae, Cg.
- Acalypha*.—*Amphicerus terebrans* Pall.
- Poinciana*. *regia*.—*Lyncestis acontiodora* Guen.

In addition to the work, done with regards to the above mentioned pests, advice was given to the members of the general public who made numerous enquiries on garden and household pests or asked for identifications of specimens.

Various articles on entomological problems were contributed to the Journal of the Agricultural Society. A public lecture on Ants and one on Termites were delivered to the Agricultural Instructors.

A Bulletin on 'Insect pests of Sweet Potato and Cassava in Jamaica' was published.

During the absence of the Microbiologist from the Colony the Entomologist officiated in the two posts.

Additions were made to the Collection and in this respect I am again indebted to the Imperial Institute of Entomology for the identification of specimens.

W. H. EDWARDS,
Government Entomologist.

VI.—AGRICULTURAL EDUCATION.

Annual Report of Headmaster Government Farm School.

The students in attendance during the year were as follows:—

Easter Term	..	..	...	60
Midsummer Term	..	..	...	59
Christmas Term	..	..	...	55

2. *Students.*—The following students completed their course at the end of the Christmas Term:—

A. E. Isaacs	A. W. Campbell	A. G. Plunkett
L. C. Anderson	L. H. O'Sullivan	R. C. Bridge
H. H. Williams	N. H. Mullings	J. M. Chisholm
D. H. Halstead	A. L. Virtue	A. H. Blackwood
R. F. Farr	W. V. King	L. S. Marston
F. B. Lewis	C. B. Elliott	C. C. Henry.

3. *Curriculum.*—The usual work was carried out.

4. *General.*—The students rendered considerable aid on the Stock Farm and Experiment Station. The Farm School Branch of the Students' Christian Movement, under the guidance of Mr. Hallett, continued to be a very good factor in the School activities.

The addition of a Metal Workshop completed at the end of the year should provide a useful adjunct to our work.

R. S. MARTINEZ.
Headmaster.

Report of Medical Officer.

I have the honour to report that the general Health of the Students of the Hope Farm School for the year ending December 31st 1930 has been very good. A student suffering from Scarlet Fever was promptly isolated and removed to Bumper Hall.

No other case occurred at the Farm.

G. P. CAMPBELL,
Medical Officer.

VII.—LIVE STOCK.

GOVERNMENT STUD FARM, GROVE PLACE, MANCHESTER.

Live Stock, Grove Place, 1930.

1	Imported Jersey Bull
1	Native Pedigree Jersey Bull
1	Native Aberdeen Angus Bull
1	Pedigree Ayrshire Bull
2	Grade Montgomery Bulls
8—2	Bull Calves of 1930
7—7	Pedigree Cows and Heifers
62—62	Native Cows
1	Grade Native Heifer
3	Grade Ayrshire Heifers
15	Grade Brown Swiss Heifers
1	Grade Devon Heifer
25	Grade Guernsey Heifers
25	Grade Jersey Heifers
76—6	Grade Red Poll Heifers
2—2	Steers

155

Horsekind.—

1	Imported English Thoroughbred Stallion, "Royal Highness"
1	Imported Proof Ass, "Kentucky Boy"
8	Brood Mares
2	Fillies
1	Gelding
17	Mules
4	Donkeys

34 Head



ENGLISH THOROUGHBRED STALLION, "ROYAL HIGHNESS",
AT GROVE PLACE FARM.



CANADIAN HOLSTEIN-FRIESIAN BULL, "SIR FRANCY ROMEO POSCH"
AT HOPE FARM.

The following is the summary of the Valuation of Livestock at Grove Place on 31st March, 1930.—

			£	s.	d.
Cattle	..	..	1,411	15	0
Horsekind	..	..	911	0	0
Total			£2,322	15	0

SERVICES OF BULLS AT GROVE PLACE, 1ST JANUARY TO 31ST DECEMBER, 1930.

No.	Bulls.	Visiting Cows.	Farm Cows.	Total.
1.	Jersey Bull "Glen" ..	13	18	31
2.	Jersey Bull "Etta's Pogis" ..	13	13	26
3.	Montgomery-Guernsey "Cortes" ..	6	7	13
4.	Montgomery-Brown Swiss "Justice" ..	5	7	12
5.	Ayrshire "Food Controller" ..	..	4	4
		37	49	86

GOVERNMENT STOCK FARM, HOPE.

Live Stock, Hope Stock Farm, 1930.

PEDIGREE STOCK.

Red Polls—

Imported Red Poll Bull ..	..	..	1	
Native Red Poll Bull Calves ..	..	..	2	
Imported Red Poll Cows ..	..	..	..	
Native Red Poll Cows and Heifers ..	..	..	32	35

Jerseys—

Imported Jersey Bull ..	..	..	1	
Native Jersey Bull and Bull Calves ..	..	..	4	
Imported Jersey Cow ..	..	..	1	
Native Jersey Cows and Heifers ..	..	..	27	33

Guernseys—

Imported Guernsey Bull ..	..	..	1	
Native Guernsey Bull Calves ..	..	..	2	
Native Guernsey Cows and Heifers ..	..	..	4	7

Ayrshires—

Native Ayrshire Heifer ..	..	..	1	1
---------------------------	----	----	---	---

Brown Swiss—

Native Brown Swiss Cows and Heifer ..	..	..	6	6
---------------------------------------	----	----	---	---

Montgomery—

Imported Montgomery Bull ..	..	..	1	1
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Holstein-Friesian—

Imported Holstein-Friesian Bull ..	..	..	1	1
------------------------------------	----	----	---	---

Total Pedigree Stock,	..	..		84
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Bulls—

GRADED STOCK.

Grade Montgomery Bulls and Bull Calves ..	..	..	9	
Grade Guernsey Bull and Bull Calves ..	..	..	6	
Grade Jersey Bull Calf ..	..	..	1	16

Cows—

Dairy Cows ..	..	..	104	
Foster Mothers ..	..	..	9	113

Heifers—

Grade Native Heifer ..	..	..	1	
Grade Ayrshire Heifers ..	..	..	4	
Grade Guernsey Heifers ..	..	..	40	
Grade Holstein Heifers ..	..	..	2	
Grade Brown Swiss Heifers ..	..	..	5	
Grade Jersey Heifers ..	..	..	43	
Grade Montgomery Heifers ..	..	..	8	
Grade Red Poll Heifers ..	..	..	4	107

<i>Steers—</i>					
Plough Steers	..	..	..	12	12
Total Graded Stock,		..	..		248
Grand Total	..		..		332
<i>Horsekind—</i>					
20	20	Mules			
<i>Poultry—</i>					
1 Pen Rhode Island Red.					
<i>Bees—</i>					
Nil.					

NEWLY IMPORTED SIRE.

IMPORTED HOLSTEIN-FRIESIAN BULL—"SIR FRANCY ROMEO POSCH 70686"

Born: December 13, 1926.

Sire: "Sir Romeo Banostine 55973."

Dam: "Jennie Francy 85821."

Purchased from Holstein-Friesian Association of Canada.

Cost: £138.

Landed June, 1930.

WEEKLY ANALYSIS OF MILK SUPPLIED TO THE PUBLIC HOSPITAL, LUNATIC ASYLUM AND GENERAL PENITENTIARY BY THE HOPE STOCK FARM, 1930.

Quarter ending		Solids.	Fat.	Sp. Gravity.	Solids Not Fat.
March 31, 1930	..	13.83	5.08	1.0304	8.75
June 30, 1930	..	13.46	4.72	1.0306	8.74
September 30, 1930	..	13.67	5.10	1.0273	8.57
December 31, 1930	..	13.96	5.33	1.0297	8.63
		13.73	5.06	1.0295	8.67

The following is a summary of the Valuation of the Live Stock at the Hope Farm to 31st March, 1930

				£	s.	d.
Cattle	..	..	..	7,489	10	0
Horsekind	..	..	..	294	0	0
Poultry	..	..	..	67	18	0
Total	..			£7,851	8	0

MILK YIELD, DAIRY HERD, 1926, 1927, 1928, 1929, 1930.

Imperial Quarts per diem.

Month.		1926.	1927.	1928.	1929.	1930.
January	..	401.0	433.7	400.1	490.0	456.6
February	..	386.3	392.0	353.1	459.0	519.5
March	..	414.4	107.4	401.6	454.8	491.5
April	..	435.8	459.2	478.3	464.0	600.4
May	..	453.2	503.1	520.6	466.9	627.9
June	..	485.2	444.4	533.0	499.9	600.2
July	..	511.4	476.1	564.1	527.8	595.0
August	..	567.6	489.4	557.5	562.5	556.4
September	..	519.2	456.2	524.7	538.3	568.1
October	..	526.8	396.9	463.0	480.7	583.8
November	..	492.1	424.6	445.7	471.1	593.4
December	..	473.3	429.7	455.4	474.0	545.3
		472.2	442.7	474.7	490.8	561.5

RECORD OF DAIRY HERD MILK YIELD, 1930.

Month.			Av. No. of Cows.	Total Qts. per mensem.	Av. per Cow-Qts.
January	..	..	83	14153.4	5.5
February	..	..	81	14545.3	6.4
March	..	..	77	15237.1	6.4
April	..	..	84	18012.0	7.1
May	..	..	88	19465.0	7.6
June	..	..	86	18007.1	6.9
July	..	..	91	18446.5	6.5
August	..	..	95	17249.4	5.9
September	..	..	95	17043.4	5.9
October	..	..	97	18099.1	6.0
November	..	..	101	17803.1	5.9
December	..	..	98	16903.0	5.6
			89	17080.4	6.3

MILK YIELD, 1930, HOPE FARM DAIRY HERD.

No.	Name of Cow.	Breed.	Age in years.	Average Content Milk Fat.	Yield in lbs.	Milking Weight.	Max. yield Imp. Qts.	Sale Price at 8d. per Qrt.
1	Norbrook 4th ..	Grade Jersey ..	5	5.0	7,974	1,090	17.1	£ s. d. 102 12 2
2	Norbrook 5th ..	Grade Jersey ..	3	5.2	7,492	920	18.1	96 7 10
3	Cognac 2nd ..	Grade Holstein ..	8	4.7	7,446	1,110	21.9	95 16 0
4	Diva 10th ..	Grade Guernsey ..	6	4.2	7,265	986	16.9	93 9 6
5	Portia ..	Jersey ..	8	3.7	6,985	870	19.8	89 17 5
6	Pogistine ..	Jersey ..	7	5.2	6,784	776	17.2	87 5 11
7	T. N. T. ..	Grade Guernsey ..	4	4.4	6,769	912	19.4	87 2 0
8	Norma ..	Grade Montgomery ..	4	4.0	6,658	934	16.0	85 12 3
9	Timorette 4th ..	Grade Jersey ..	7	5.3	6,650	800	13.6	85 11 4
10	Sola 5th ..	Grade Zebu Jersey ..	11	4.1	6,601	1,190	15.7	84 18 7
11	Paste 1st ..	Grade Jersey ..	5	5.1	6,598	820	12.3	84 18 0
12	Pussy 2nd ..	Grade Red Poll ..	7	4.8	6,452	1,042	18.3	83 0 2
13	Alicia ..	Grade Jersey ..	6	5.2	6,344	960	13.4	81 12 5
14	Norbrook 3rd ..	Grade Holstein ..	6	4.1	6,280	1,224	16.0	80 16 1
15	Marchioness 3rd ..	Grade Ayrshire ..	5	4.4	6,222	1,055	13.7	80 0 11
16	Monica 16th ..	Grade Guernsey ..	4	4.7	6,203	1,022	20.6	79 16 5
17	Polda ..	Grade Jersey ..	3	4.6	6,203	818	17.7	79 16 1
18	Baby 2nd ..	Grade Montgomery ..	7	5.9	6,191	1,150	13.1	79 13 4
19	Hope Brisk 3rd ..	Red Poll ..	7	4.4	6,115	1,026	17.4	78 13 4
20	Hope Beta 3rd ..	Red Poll ..	10	3.9	6,109	990	13.2	78 12 1
21	Quail 8th ..	Grade Jersey ..	5	5.9	6,102	890	17.4	78 10 6
22	Shrew 13th ..	Grade Guernsey ..	8	4.0	5,970	890	16.5	76 16 7
23	Matilda 12th ..	Grade Jersey ..	8	4.7	5,948	880	15.0	76 10 6
24	Susy ..	Grade Montgomery ..	5	5.0	5,854	1,030	11.9	75 6 2
25	Monica 7th ..	Grade Guernsey ..	8	3.1	5,740	1,056	13.8	73 17 0
26	Baby 4th ..	Grade Jersey ..	5	5.8	5,737	900	13.1	73 16 4
27	Sayda ..	Jersey ..	7	4.7	5,700	792	19.9	73 6 11
28	Vickie C. ..	Grade Montgomery ..	7	4.3	5,669	1,010	13.2	72 18 7
29	Diva 7th ..	Grade Guernsey ..	9	4.5	5,586	998	14.2	71 17 9
30	Dodo 3rd ..	Grade Holstein ..	7	3.8	5,569	1,224	17.7	71 13 0
31	Hope Flighy 1st ..	Red Poll ..	7	3.9	5,526	1,000	19.0	71 1 11
32	Meadow ..	Grade Montgomery ..	7	5.4	5,522	1,000	13.9	71 0 11
33	Bess 1st ..	Grade Guernsey ..	10	4.5	5,513	1,050	16.0	70 18 5
34	Monica 15th ..	Grade Guernsey ..	5	3.9	5,451	872	14.7	70 2 9
35	May 4th ..	Grade Jersey ..	8	5.4	5,441	1,030	14.5	70 0 0
36	Laurel ..	Grade Guernsey ..	3	4.6	5,383	970	10.6	69 5 5
37	Porosa 2nd ..	Grade Red Poll ..	9	3.7	5,344	1,128	13.0	68 15 0
38	Hood's Ethelstine ..	Jersey ..	7	4.4	5,279	944	14.8	67 18 0
39	Baby 5th ..	Grade Jersey ..	5	5.4	5,229	878	13.2	67 5 8
40	Monica 12th ..	Grade Guernsey ..	10	4.2	5,208	900	14.7	67 0 0
41	Lydite 4th ..	Grade Holstein ..	7	4.1	5,187	1,120	13.5	66 14 9
42	Rosette 8th ..	Grade Guernsey ..	7	4.2	5,126	872	13.1	65 19 1
43	Blossom 1st ..	Grade Zebu Jersey ..	12	4.6	5,113	926	14.3	65 15 9
44	Perfume ..	Jersey ..	7	4.2	5,096	850	17.2	65 11 1
45	Rosette 10th ..	Grade Montgomery ..	5	5.5	5,095	834	12.2	65 1 8
46	Pigeon 2nd ..	Grade Brown Swiss ..	9	5.5	5,052	1,056	14.6	65 0 1
47	Ada 2nd ..	Grade Jersey ..	6	5.4	5,010	842	9.1	64 9 1
48	Tilda 9th ..	Grade Jersey ..	5	4.8	4,993	982	9.6	64 4 9
49	May Fly ..	Grade Guernsey ..	5	5.9	4,981	890	19.8	64 1 10
50	Prioreess ..	Red Poll ..	6	4.2	4,955	1,126	17.4	63 14 11
51	Tilda 4th ..	Grade Montgomery ..	8	5.4	4,950	1,050	11.7	63 13 10
52	Bess 2nd ..	Grade Montgomery ..	6	5.5	4,848	1,024	10.5	62 7 3
53	Ethelstine 2nd ..	Jersey ..	8	5.2	4,814	890	12.7	61 18 10
54	October ..	Brown Swiss ..	9	4.3	4,806	1,026	11.9	61 16 7
55	Panama's Betty ..	Red Poll ..	8	3.7	4,665	1,100	16.5	60 0 5
56	Marchioness 12th ..	Grade Montgomery ..	8	6.3	4,591	1,052	17.2	59 1 4
57	Truth 4th ..	Grade Jersey ..	8	5.0	4,549	1,060	12.0	58 10 7
58	Wye 1st ..	Grade Montgomery ..	7	4.8	4,507	1,016	10.7	57 19 9
59	Angel 11th ..	Grade Holstein ..	8	4.7	4,432	1,218	16.2	57 0 4
60	Hood's Mead ..	Jersey ..	6	5.4	4,309	1,000	14.2	55 8 9
61	Pollen ..	Jersey ..	6	5.9	4,307	858	11.4	55 8 2
62	Diva 22nd ..	Grade Guernsey ..	8	4.8	4,298	792	6.1	55 6 2
63	Perfect ..	Jersey ..	7	4.8	4,296	922	16.5	55 5 3
64	Veracity ..	Grade Guernsey ..	5	7.8	4,263	917	10.5	54 17 0

CASH—APPROPRIATION.

RECEIPTS.

PAYMENTS.

	Approved Estimates.	Revised Estimates.	—	Actual.		—	Approved Estimates.	Revised Estimates.	Actual.
	£	£	£ s. d.	£ s. d.		£ s. d.	£	£	£ s. d.
Balance 31.3.29 ..	950	1,341	..	2,131 6 6½	Personal Emoluments—	..	100	100	100 0 0
Milk Sales ..	5,500	5,200	..	5,187 14 2	Accountant ..	..	60	60	60 0 0
Butter Sales ..	100	33	..	32 13 2	Clerk ..	..	100	100	100 0 0
Live Stock Sales Auction ..	..	..	945 10 0	1,457 6 9	Foreman ..	..	900	1,017	995 15 0
Private ..	300	1,052	511 16 9	..	Wages ..	..	..	..	..
Poultry Sales ..	50	36	..	52 16 9	Other Charges—	..	..	..	..
Rents ..	100	90	..	121 2 7	Food for Stock:—	..	..	..	..
Bombay Mango Sales ..	300	361	..	361 4 9½	Growing Canes ..	..	32 9 3	..	32 9 3
Pine Sales ..	150	60	..	65 7 10½	Growing Guinea Corn ..	..	63 8 2	..	63 8 2
Miscellaneous:—	..	..	..	..	Manufacturing G. C. Silage ..	..	50 13 9	..	50 13 9
Interest Bank ..	£ 33 15 11	..	..	..	Imported and Other Feeds ..	..	1,507 14 0	1,715	1,654 5 2
Rearing Calves ..	11 19 0	..	..	..	Crops (Pines 3 acres) ..	..	..	80	74 5 7
Acts, Rec. 1928-29 ..	134 12 2	..	..	..	Rearing Calves at Grove Place ..	..	..	150	137 16 0
Deposits ..	309 6 0	..	..	..	Cleaning and Fencing ..	..	..	600	508 6 1
Sale of Feed ..	1 1 4	..	..	..	Buildings, Machinery and Equipment:—	..	..	..	..
Truck ..	58 9 7	..	..	..	Repairs and Additional Buildings ..	..	401 2 7	..	..
Refd. Live Stock Purchase ..	3 2 1	120	..	574 11 6	Repairs and Additional Machinery ..	..	237 19 11	..	..
Sundries ..	22 5 5	..	..	..	Furniture and Fixtures—	..	..	..	..
	..	..	..	..	Completion New Road to Sixty ..	..	..	..	..
	..	..	..	..	Stanchions ..	..	..	..	..
	..	..	..	..	Cuttabug Water Supply ..	£ 28 18 0	..	..	..
	..	..	..	..	Sixty Stanchion Water Supply ..	156 12 5	..	..	..
	..	..	..	..	Sixty Stanchion Irrigation Tank ..	124 2 7	..	..	..
	..	..	..	..	Electric Light Completion ..	54 2 9	..	..	..
	..	..	..	..	Milk Churns ..	5 2 0	..	..	..
	..	..	..	..	Scale Fittings ..	41 14 8	..	..	..
	..	..	..	..	Clock ..	14 1 5	..	..	..
	..	..	..	..	Overalls ..	3 9 5	..	..	..
	..	..	..	..	Milk Scales ..	26 11 8	..	..	..
	..	..	..	..	Step Ladder ..	4 11 4	..	..	..
	..	..	..	..	Milk Cans ..	1 5 0	..	..	..
	..	..	..	..	Tools and Implements:—	2 0 7	..	..	..
	..	..	..	..	Repairs and Replacements ..	..	..	..	..
	..	..	..	..	Vehicles and Harness:—	..	..	..	..
	..	..	..	..	Repairs and Replacements ..	..	..	..	..
	..	..	..	..	Stores and Parts ..	..	..	..	..
	..	..	..	..	General Repairs ..	..	..	..	..
Carried forward ..	..	..	..	9,984 4 1½	Carried forward ..	..	..	2,000	1,766 17 4
	..	..	..	..		..	..	..	5,397 5 2

HOPKINSON STOCK FARM, 1929-30 ENDED 31.3.30.

BALANCE SHEET.

<i>Assets.</i>		£ s. d.	£ s. d.	<i>Liabilities.</i>		£ s. d.	£ s. d.
Buildings—				Accounts Payable—			
As at 31.3.29	..	2,370 8 6		Treasurer for New York			
Additions ..	..	397 19 8		Agents ..	..	46 16 3	
				G. C. Gunter ..	..	0 2 0	
		2,768 8 2		Fernando Castro ..	..	1 3 8	
Depreciation ..	..	59 12 0	2,708 16 2	W. L. Barnett ..	..	0 18 10	
				Gustavo Michelsen ..	..	0 10 10	49 11 7
Machinery—				Jamaica Government Balance			
As at 31.3.29	..	633 4 10		of Grant for purchasing			
Additions ..	..	182 11 2		Live Stock ..	..	2,038 7 10	
		815 16 0		Less the following supplied			
Depreciation ..	..	74 11 11	741 4 1	to Stock Farm in Man-			
				chester during year ..	..		
Furniture and Fixtures—				1 horse 432 11 5			
As at 31.3.29	..	576 12 8		2 Bulls 333 16 2	..	766 7 7	1,272 0 3
Additions ..	..	460 16 7					
		1,037 9 3		Profit and Loss—			
Depreciation ..	..	48 16 5	988 12 10	As at 31.3.29 ..	..	13,309 8 7½	
				Add Profit for the year	..	865 2 7	14,174 11 2½
Truck—							
As at 31.3.29	..	25 0 0					
Additions ..	..	175 0 0					
		200 0 0					
Depreciation ..	..	20 0 0	180 0 0				
Tools and Implements—							
As at 31.3.29	..	124 18 2					
Additions ..	..	14 12 6					
		139 10 8					
Depreciation ..	..	31 14 2	107 16 6				
Vehicles and Harness—							
As at 31.3.29	..	296 10 0					
Additions ..	..	82 1 6					
		378 11 6					
Depreciation ..	..	39 10 0	339 1 6				
Stores and Parts (Stock as per Inventory)			323 12 10				
Food for Stock (Stock as per Inventory)			417 14 0				
Plantation (3 acres Pines) ..			100 0 0				
Live Stock (as per certified Valuation)			7,851 8 0				
Accounts Receivable—							
E. Downes ..	..	0 15 0					
Public Hospital ..	..	128 17 4					
Jubilee Hospital ..	..	6 3 0					
Lunatic Asylum ..	..	96 8 4					
General Penitentiary ..	..	3 0 0					
A. F. Thelwell ..	..	0 19 4					
Dr. J. Myers ..	..	0 10 4					
E. E. Muirhead ..	..	0 18 6	237 11 10				
Cash—							
In Bank, ..	..	1,499 3 1					
In Hand ..	..	1 2 2½	1,500 5 3½				
			£15,496 3 0½				£15,496 3 0½

N. B. DONALDSON, Accountant.

. H. COUSINS, Director of Agriculture.

HOPE STOCK FARM YEAR 1929-30 ENDED 31.3.30.

PROFIT AND LOSS ACCOUNT.

	£	s.	d.	£	s.	d.		£	s.	d.
To Depreciation—							By Plantation (Pines)			
Buildings	59	12	0				Live Stock	136	11	6
Machinery	74	11	11				Milk ..	5,424	13	8
Furniture & Fixtures	48	16	5				Butter ..	25	17	0
Truck	20	0	0				Rents	77	3	7
Tools & Implements	31	14	2				Bombay Mangoes	286	18	9½
Vehicles & Harness	39	10	0	274	4	6	Rearing Calves for			
							Grove Place	11	19	0
Repairs and Upkeep—							Interest (Bank)	33	15	11
Buildings	3	2	11				Miscellaneous	19	19	7
Machinery	55	8	9							
Furniture & Fixtures	1	15	3							
Truck (including running expenses)	130	19	8							
Tools & Implements	43	6	2							
Vehicles & Harness	46	11	11							
General Repairs	348	0	10	629	5	6				
Food for Stock (Consumed)				2,009	9	11				
Miscellaneous Expenses				250	7	6				
Wages				995	15	0				
Growing Bombay Mangoes				80	19	5				
Cleaning & Fencing				508	6	1				
Taxes				10	12	0				
Accountant				100	0	0				
Clerk				60	0	0				
Foreman				100	0	0				
Rearing Calves at Grove Place				137	16	0				
Account Mrs. L. Powell written off				0	0	3				
Balance (Net Profit for the year)				865	2	7				
				£6,021	18	9				
								£6,021	18	9

N. B. DONALDSON,
Accountant.

H. H. COUSINS,
Director of Agriculture.

VIII.—GOVERNMENT LABORATORY.

Report of the Deputy Island Chemist.

The total number of samples analysed during the year ended 31st December, 1930, was 2,675, and compares with the two former years as under:—

1928.	1929.	1930.
2,659	2,549	2,665

The samples are classified as follows:—

"A" OFFICIAL.

(I) *Police*—

Human viscera and organs ..	..	..	90
Stomach contents and vomits ..	..	..	7
Animal viscera ..	..	..	1
Substances for poison ..	..	..	88
Coins, genuine ..	..	..	28
Coins, counterfeit ..	..	..	87
Counterfeiting exhibits ..	..	..	41
Currency Notes, counterfeit ..	..	..	7
Jewellery, (watches and rings) ..	..	..	5
Exhibits in murder cases:—			
Motor car parts ..	..	..	23
Clothing ..	..	..	4
Firearms ..	..	..	2
Cartridges ..	..	..	51
Bullets ..	..	..	5
Miscellaneous ..	..	..	2

<i>Under the Gunpowder and Firearms Law.</i>					
Dynamites	..	..	..	..	5
Caps	..	..	..	..	10
<i>Under the Spirit License and Rum Duty Laws.</i>					
Rums	..	..	..	..	8
Spirits, various	..	..	..	..	16
<i>Under the Adulteration of Food and Drugs Law.</i>					
Wines	..	..	..	..	1
Flavouring Essences	..	..	..	..	1
<i>Under the Dangerous Drugs Law.</i>					
Opiums	..	..	..	..	3
Opium Exhibits, pipes, etc.	..	..	..	..	2
Ganga	..	..	..	..	388
Ganga Exhibits, pipes, rags, etc.	..	..	..	..	22
<i>Under the Petroleum Law.</i>					
Kerosine Oils	..	..	..	..	2
Gasolines	..	..	..	..	1
<i>Under the Medical Laws.</i>					
Medicines and Drugs	..	..	..	..	36
<i>Under the Sugar Industry Aid Law.</i>					
Sugars	..	..	..	..	2
Total					938
(II) <i>Customs—</i>					
Native and other Wines	..	..	..	..	43
Rectified Spirits and Absolute Alcohols	..	..	..	..	12
Bay Rums	..	..	..	..	5
Spirits, Rum Punches, etc.	..	..	..	..	19
Fuel Oils	..	..	..	..	29
Gasolines and Kerosines	..	..	..	..	8
Sugars and Syrups	..	..	..	..	6
Flavouring Extracts and Essences	..	..	..	..	21
Disinfectants and Insecticides	..	..	..	..	11
Miscellaneous	..	..	..	..	9
Total					163
(III) <i>Department of Science and Agriculture—</i>					
Animal Viscera	..	..	..	..	2
Condensed Milks	..	..	..	..	4
Sugars	..	..	..	..	8
Insecticides and Chemicals	..	..	..	..	12
Kerosine Oils	..	..	..	..	2
Instruments (for test)	..	..	..	..	1
Waters	..	..	..	..	1
Total					30
(IV) <i>Island Medical Department—</i>					
Waters, potable	..	..	..	..	4
Sugars	..	..	..	..	2
Miscellaneous, Soaps, Medicines, etc.	..	..	..	..	4
Total					10
(V) <i>Medical Officers of Health—</i>					
<i>Kingston.</i>					
Fresh Milks, genuine	..	..	..	..	4
Do. adulterated	..	..	..	..	3
Ice	..	..	..	..	1
Sugars	..	..	..	..	3

St. Andrew.

Fresh Milks, adulterated	..	..	..	3
Sugars and Candy	..	..	..	4
Total				18

Other Parishes.

Waters, potable	..	..	..	9
Tinned Fish	..	..	..	2
Total				11

(VI) Kingston and St. Andrew Corporation—

Waters, potable	..	..	..	16
Asphalts and Oils	..	..	..	6
Gas Liquors	..	..	..	2
Coals	..	..	..	2
Earths and Water Piping	..	..	..	2
Total				28

(VII) Inspectors of Agricultural Produce.—

Orange Oils	..	..	..	4
Honeys	..	..	..	6
Barrel Staves	..	..	..	5
Annatto	..	..	..	1
Lemenose	..	..	..	1
Total				17

(VIII) Department of Public Works—

Waters, irrigation	..	..	..	2
Sewerage	..	..	..	2
Minerals	..	..	..	1
Total				5

(IX) Secretary Sugar Industry Aid Board—

Icing Sugars	..	..	..	3
Total				3

(X) Jamaica Government Railway—

Waters, industrial	..	..	..	2
Total				2

(XI) Prisons Department—

Temper Lime	..	..	..	1
Limestones	..	..	..	3
Total				4
Total Official				1,229

"B" AGRICULTURAL.

Soils and Sub-soils	..	..	..	22
Agricultural Limes and Marls	..	..	..	7
Artificial Manures and Fertilizers	..	..	..	26
Molasses and Cane Juices	..	..	..	13
Total				68

"C" GENERAL.

Stock Farm Milks	..	..	..	881
Cattle Dips	..	..	..	78
Rums	..	..	..	149
Sugars	..	..	..	127
Waters, potable	..	..	..	11
Waters, industrial	..	..	..	8
Fresh and Condensed Milks	..	..	..	10
Ores and Minerals	..	..	..	17
Steam Coals	..	..	..	6
Tile Mixtures	..	..	..	12
Spirits, various, for alcoholic strength, etc.	..	..	..	14
Patent and other Medicines	..	..	..	25
Animal Viscera, for poison	..	..	..	2
Substances for poison	..	..	..	7
Essential and other Oils	..	..	..	5
Cartridges	..	..	..	4
Pimento Leaves, for distillation	..	..	..	4
Flours	..	..	..	5
Miscellaneous	..	..	..	13
Total				1,378
Grand Total				2,675

The 90 analyses of human viscera and organs, and three of stomach contents, were made in connection with 42 deaths. In 28 cases poison was found and determined in the viscera as follows:—

- (1) 0.0031 grains Yellow Phosphorus from the organs of a female adult.
- (2) 0.0031 grains Yellow Phosphorus from the organs of a female child.
- (3) 0.0025 grains Yellow Phosphorus from the organs of a male adult.
- (4) Traces of Carbolic Acid from the viscera of a female child.
- (5) 0.006 grains Yellow Phosphorus from the viscera of a male adult.
- (6) Arsenic from the organs of a female adult.
- (7) 0.0135 grains Arsenic from the viscera of a male adult.
- (8) Arsenic from the organs and stomach contents of a female adult.
- (9) 53.57 grains Antimony from the organs and stomach contents of a female adult.
- (10) 0.0185 grains Arsenic from the viscera of a male adult.
- (11) 0.003 grains Yellow Phosphorus from the organs of a male adult.
- (12) 0.0016 grains Antimony in the organs from the exhumed corpse of a male child.
- (13) 0.0017 grains Antimony from the organs of a female child.
- (14) 0.68 grains Nitrobenzene from the viscera of a male adult.
- (15) Antimony equal to 0.39 grains Tartar Emetic from the viscera of a male adult (suicide).
- (16) Large traces of Antimony from the viscera of a female adult.
- (17) Traces of Phosphorus from the stomach and stomach contents of a female adult.
- (18) Oxalic Acid from the viscera of a male adult.
- (19) 0.005 grains Yellow Phosphorus from the organs of a male adult.
- (20) 0.0042 grains Antimony from the viscera of a male adult.
- (21) Ammonia in the stomach and contents of a male adult.
- (22) 0.0107 grains Antimony from the organs of a male adult.
- (23) 0.018 grains Arsenic from the viscera of a male adult.
- (24) 0.75 grains finely powdered glass from the intestines of a male child.
- (25) 6.78 grains Mercury (Corrosive Sublimate) from the viscera of a female adult.
- (26) 0.03 grains Arsenic from the organs of a female adult.
- (27) Arsenic from the organs of a male child.
- (28) 0.08 grains Antimony from the viscera of a male adult.

The substances examined for poison which gave positive results were as follows:—

- (1) Antimony in a sample of water.
- (2) Antimony in a sample of water.
- (3) Antimony in a sample of water.
- (4) Nitrobenzene in medicine which had caused death.
- (5) Antimony and dilute Sulphuric Acid in a liquid.
- (6) Dilute Sulphuric Acid and Turpentine in a liquid.
- (7) Powdered glass in food.
- (8) Arsenic (Cattle Dip) in water jar.
- (9) Arsenic in a powder.
- (10) Arsenic in a powder.
- (11) Arsenic in cooked food.
- (12) Arsenic in cooked food.
- (13) Powdered glass in food.
- (14) Nitrobenzene in almond favourings (Four).
- (15) Lead Acetate in a lotion.

- (16) Lead Acetate in cooked fish.
- (17) Copper Sulphate in water (22 grains per pint).
- (18) Arsenic (Cattle Dip) in rum.
- (19) Carbolic Acid on clothing (Two).
- (20) Arsenic in a powder.
- (21) Lead Acetate in a powder.
- (22) Mercury (Corrosive Sublimate) in pills.
- (23) Mercury (Red Precipitate) on a plate.
- (24) Antimony in a sample of urine.

The animal viscera examined, that of a dog, was found to contain Yellow Phosphorus.

Two samples of vomited matter contained Mercury (Red Precipitate) and one sample Arsenic.

The number of human viscera and organs submitted by the Police shew a great increase over previous years, being 33 more than last year.

A fatal case of poisoning by Nitrobenzene was investigated, and it was ascertained that the deceased drank Nitrobenzene in mistake for Sweet Spirits of Nitre; the amount of Nitrobenzene separated from the stomach of the deceased was 0.68 of a grain. Four samples of so called Almond and Rose Water flavouring were analysed and in each case Nitrobenzene had been substituted for genuine Almond oil. Legal proceedings were taken against the manufacturers under the Adulteration Law and the case was dismissed, despite the fact that the defence admitted that Nitrobenzene was used and that it was a poisonous substance. An extraordinarily large amount of Mercury, amounting to 6.78 grains, was found in the viscera of a young Chinese woman. It was ascertained that the woman had taken a quantity of pills which she had brought from China, and that these pills were heavily coated with Red Precipitate.

214 certificates were issued to the Police during the year for use in various prosecutions.

The number of counterfeit coins examined was less than last year, and the number of moulds and counterfeiting exhibits also showed a good decrease.

Seven counterfeit notes, purporting to be Ten Shilling Jamaica Currency Notes, were examined and were found to be crude imitations. The design appeared to have been impressed by means of a rubber or wooden stamp, and the ink was of the nature of powdered crayons. The lettering on these counterfeit notes differed in each one, and appeared to have been written by hand.

Five articles of imitation gold, watches and rings, were submitted by the Police in connection with prosecutions for obtaining money by false pretences. These articles were made of brass which had been thinly gilded with a thin film of gold. The number of exhibits submitted in various cases of murder and manslaughter numbered 87. These comprised particles of glass from broken Motor car headlamps which were picked off the car of the accused and particles of glass picked up off the road at the scene of the accident, also motor car bumpers taken off the car.

The examination of various firearms and cartridges was carried out in connection with a case of murder by shooting.

Five specimens of dynamite and ten caps were examined in connection with prosecutions for the illegal possession of explosives. The explosives were taken from persons who had been catching fish by dynamite off Port Henderson.

24 samples of Rum and Spirits were analysed in connection with offences under the Spirit License and Rum Duty Laws.

A sample of flavouring essence submitted under the Adulteration Law contained a large proportion of Nitrobenzene.

The number of samples submitted under the Dangerous Drugs Law was 415, of which 410 consisted of either Ganga or articles containing Ganga.

The Customs submitted 163 samples as against 152 for last year. These consisted of imported spirits oils, fuels, sugars and syrups and disinfectants for classification under the Tariff Law. 43 native wines were analysed for the content of proof spirit for drawback on exportation.

For the Department of Science and Agriculture 30 samples were submitted during the year of a miscellaneous nature.

The Island Medical Department submitted 10 samples, and the Medical Officers of Health submitted 29 samples, the samples comprising food stuffs, waters, medicines and soaps.

For the Kingston and St. Andrew Corporation a total of 28 analyses were made. The 16 samples of water were in connection with the quarterly examination of the drinking water supplies of the Corporate Area. 6 samples of Asphalt and Oils were examined in connection with their use on roads.

17 samples were submitted by the Inspectors of Agricultural Produce, and comprised Orange Oils, honeys and annatto. An investigation was carried out into the darkening of honey on storage in wooden barrels made of various kinds of wood. The extent of darkening of the honey was found to be approximately proportional to the amount of tannin in the wood. Suggestions were made whereby it was hoped that this defect could be remedied, either by leaching out the tannin from the barrels or by coating the inside of the barrels with paraffin wax of suitable high melting point.

A substance which was manufactured abroad for the sophistication of Orange Oils was analysed and recommendations were made to prevent its use, and also tests for its detection in Orange Oils were devised.

Other Public Departments also submitted a variety of samples for analysis, but these call for no special comment.

AGRICULTURAL.

68 samples were analysed under this head, being five less than last year. More interest is being taken by various planters concerning the hydrogenion concentration of their soils, and the use of lime or marl for the correction of acidity.

GENERAL.

Under this head 1,378 samples were analysed, being an increase of 372 over last year. Stock Farm milks numbered 881, being an increase of 346. As usual the milk from the Stock Farm shows a great superiority over samples of milk supplied from other sources.

78 samples of Cattle Dips were analysed and in cases where it was weak suitable recharges were recommended.

Rums and sugars were about the same as last year, the latter showing an increase of 21 samples.

Six samples of Tile mixtures were analysed to ascertain the nature of the colouring matter, and its resistance to light and water.

Four parcels of pimento leaves were submitted to large scale steam distillation test to ascertain the yield of oil, and the Eugenol content of the resulting oil was determined. A consignment of imported rose plants was fumigated with Hydrocyanic Acid Gas in the new Fumigatorium at the Railway Wharf in Kingston.

Five samples of flour were submitted for examination to determine the cause of deterioration.

The manufacture and sale of Paranaph and Flykiller was continued throughout the year, and the efficiency of the latter was improved, whilst the cost of production was reduced.

The following table shows the nature and amounts of materials issued to the public for the past three years:—

	1928.	1929.	1930.
Paranaph	37,353	37,849	33,512 lbs.
Arsenite of Soda	21,900	21,725	20,175 lbs.
Copper Sulphate	198	275	70 lbs.
Carbon Bisulphide	847	492	516 lbs.
Rat Poison, in bulk	341	265	162 lbs.
Rat Poison, 1 oz. pkts.	96	nil.	65 pkts.
Standard Iodine Sol.	46,950	47,750	41,750 ccs.
Thymol Powders	260	330	466 ozs.
Starch Solution	248	237	211 bottles
Soda Bicarbonate	60	58	48 bottles
Cyanogas	nil.	nil.	76 lbs.
Flykiller	nil.	nil.	194 gallons.

The receipts for Laboratory Fees and Sales for the past three years are as follows:—

	1928.	1929.	1930.
	£ s. d.	£ s. d.	£ s. d.
Laboratory Sales	1,025 0 0	937 19 9	841 8 3
Laboratory Fees	213 0 0	204 1 0	274 3 6

The Laboratory Staff now consists of the Deputy Island Chemist, three Assistants, Clerk and Storekeeper, and four Apprentices.

Mr. C. L. A. Rennalls who occupied the position of Clerk and Storekeeper, left the Laboratory early in the year and Mr. L. A. Boothe was appointed in his place.

W. L. BARNETT, M.A., B.Sc., F.I.C.
Deputy Island Chemist.

IX. STAFF.

During the year Mr. L. A. Boothe was appointed Clerk and Storekeeper at the Government Laboratory vice Mr. C. L. A. Rennalls resigned.

The Chemical Staff at the Laboratory was strengthened by the appointment of Mr. E. K. P. Blake as an additional Technical Assistant.

Mr. T. P. Lecky, Foreman of the Hope Farm School, resigned in August, 1930, and was succeeded by Mr. G. E. Redshaw.

Vacation Leave—Mr. E. Downes, Horticulturist and Mr. A. F. Thelwell, Assistant Master of the Farm School were absent from the Colony on vacation leave for six months and three months respectively.

Mr. W. H. Edwards, Entomologist, attended the Imperial Entomological Conference in London as a delegate in June, 1930 and thereafter obtained six weeks vacation leave before returning to Jamaica.

Miss V. M. Barrows and Miss I. R. Mein, Typists and Stenographers, obtained leave for six weeks and one month respectively.

Mr. H. B. Cole, Technical Assistant was granted leave for six weeks and Mr. E. M. Carey, Inspector of Plant Diseases leave for one month.

H. H. COUSINS,
Director of Agriculture and Island Chemist.

